Dental

Abstracts

A selection of world dental literature / Volume 4 · Number 3 · March 1959

VOLUME 4 · NUMBER 3 · MARCH 1959

Dental Abstracts

A selection of world dental literature

Lon W. Morrey, D.D.S., editor
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AMERICAN DENTAL ASSOCIATION 222 E. SUPERIOR ST. CHICAGO 11

Published monthly by the American Dental Association at 1009 Sloan Street, Crawfordsville, Indiana. Entered as second class matter at the Post Office at Crawfordsville, Indiana, under the act of March 26, 1956. Change of address notices, undeliverable copies, orders for subscriptions, and other mail items are to be sent to editorial and executive offices, 222 East Superior Street, Chicago 11, Illinois. Printed in U.S.A. Subscription $8.00 a year in U.S.A.; $9.00 outside U.S.A. Single copy $1.00. Issue of March 1959, Vol. 4, No. 3. Copyright 1959 by the American Dental Association. All expressions of opinion and statements of supposed fact are those of the author of the abstracted article and are not to be regarded as expressing the views of the American Dental Association unless such opinions or statements have been adopted by the Association.

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Anesthesia and analgesia

Dental needle sterilization

Edward C. Raffetto and Worth B. Gregory, Jr.
M.Technicians Bul. 9:207-209
Sept.-Oct. 1958

A modification of the Ogden (1957) method for sterilizing needles provides a convenient and effective method for the utilization of autoclaved needles for dental anesthesia. The primary difficulty with the Ogden method is the maintenance of sterility after autoclaving. A lesser problem is the identification of long and short needles without contaminating them.

The modified procedure involves the following steps:

1. The needle is scrubbed and placed in a surgical detergent solution for at least one hour.

2. The needle is irrigated with a surgical detergent solution by holding the needle in the lumen of a 10 cc. glass syringe. Irrigation with distilled water is then performed in the same manner.

3. To prepare the needle for autoclaving, a syringe hub is placed on the needle and the needle point is checked for sharpness. The needle is inserted through the soft rubber end of an empty lidocaine ampule, after the hard rubber plunger has been removed. The needle-hub-ampule combination then is inserted, hub end first, into a 10 cc. Pyrex test tube containing a small plug of cotton. A cotton roll is used to plug the open end of the test tube.

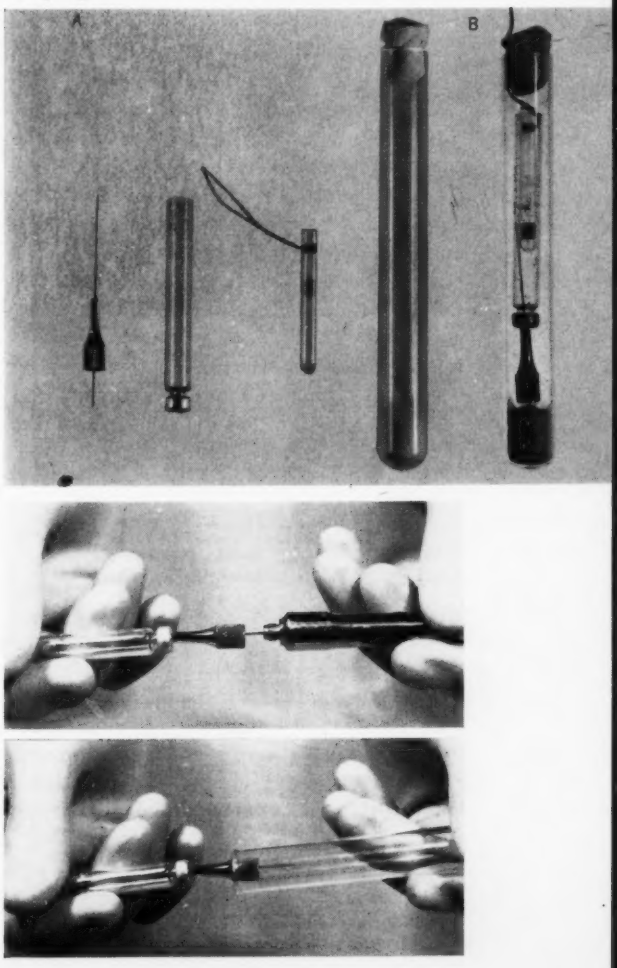
4. Several test tubes with their needle-hub-ampule combinations are then autoclaved. One of the test tubes should contain a sterilization indicator. After autoclaving, the test tube units are distributed to the various dental offices where they are placed in cabinet drawers.

As the needle can be seen through the glass test tube, it is easy to determine what length needle is in the test tube without endangering the needle's sterility. The needle point also is completely protected from blunting or contamination. The ampule serves as an efficient and convenient handle, both when the needle is removed from the test tube and when the needle is attached to the syringe.

To check the sterility achieved by this procedure, a series of test tube units was placed in a cabinet drawer for four weeks. At weekly intervals, needles from two units were placed in a cultured medium and incubated. No positive cultures were obtained.

U.S. Naval Air Station, Norfolk, Va.

Above: Preparation of dental needle for autoclaving: (A) unassembled needle with syringe hub, ampule, sterilization indicator and Pyrex test tube; (B) the assembled unit. Center: The ampule serves as a convenient handle when removing the needle from the test tube. Below: Attaching the needle to the syringe



Principles in the spectrophotometric determination of propoxycaine in the presence of procaine

Edward G. Feldmann, Walter Mahler and Henry M. Koehler. *J.Am.Pharm.A.,Sci.Ed.* 47:676-680 Sept. 1958

A number of local anesthetic preparations which contain a mixture of two anesthetic compounds currently are being offered to the dental profession. One such product incorporates a mixture of procaine hydrochloride and propoxycaine hydrochloride. Propoxycaine hydrochloride can be assayed conveniently alone by simple ultraviolet methods or by spectrophotometric titration with nitrous acid. The presence of procaine hydrochloride, however, will interfere with both of these methods as well as with most classical methods. Although a procedure for the determination of propoxycaine in the presence of procaine (Elek, 1939) generally gives satisfactory results, it is long, tedious, and requires a careful technic and relatively large samples.

A spectrophotometric method for the determination of propoxycaine in the presence of procaine has been developed. Aqueous mixtures of these two local anesthetics may be assayed for propoxycaine by an extension of principles developed in a study of a series of simple model compounds. The use of 2 N hydrochloric acid as a solvent permits the direct determination of propoxycaine with only a minimum of interference from comparable concentrations of procaine which may be present.

The pK values for the aromatic amine of propoxycaine and procaine are reported.

Division of Chemistry, American Dental Association, Chicago 11, Ill.

Absorption of local anesthetics

Donovan Campbell and John Adriani. *J.A.M.A.* 168:873-877 Oct. 18, 1958

Reactions from local anesthetics may occur irrespective of the mode of administration, but are most common after topical application. Most toxic reactions from local anesthetics are associated with high plasma drug levels from rapid absorption.

Factors that determine the rate of absorption of a local anesthetic were studied in dogs and, when possible, in human subjects. The drugs used were tetracaine, cocaine, procaine and benzocaine. Objective data were obtained in the form of actual concentrations of each drug in the blood. The concentrations obtained by intravenous injection were compared with those obtained by infusion, infiltration and topical application under various conditions.

The concentrations reached in the blood after intravenous injection were much higher when infusion was rapid than when it was slow. A rapid intravenous injection over a period of one minute resulted in a pronounced upsweep in the drug concentration to a peak level within two minutes, whereas after the infusion of the same dose slowly over a period of 20 minutes the level was barely detectable.

Absorption from the mucous membranes of the pharynx and trachea gave blood concentrations comparable to those obtained by intravenous injection.

Reactions are more common after surface application than after injection. Absorption is a function of total dosage rather than of concentration. Drug levels in the blood after the topical application of equivalent weights of cocaine as 10 per cent and 4 per cent solutions are nearly alike.

Vasoconstrictors, such as epinephrine and levarterenol, do not retard absorption from the mucous membranes. They are, however, effective in retarding absorption after perineural or subcutaneous injection. The vasoconstrictor effect of a 10 per cent solution of cocaine is no more effective in retarding absorption than the 4 per cent solution.

Local anesthetics incorporated in water soluble creams are absorbed from the mucous membranes. Absorption is poor if the drug is incorporated in an oily medium. Aqueous suspensions of the crystals give detectable drug levels when applied to the mucous membranes. Hyaluronidase facilitates the absorption of injected local anesthetics but has little influence on absorption in surface application.

The suffix "caine" appended to the name of a drug usually indicates that the compound is a local anesthetic. The suffix does not necessarily designate a particular chemical or pharmacologi-

cal type of drug. It has been used to name compounds which are similar qualitatively to procaine and cocaine in pharmacological behavior. Whether a drug is a "caine" or "noncaine" type is merely a matter of nomenclature. Nomenclature is not a criterion of toxicity or allergenic properties. Sensitization may occur from many varieties of drugs—local anesthetics included.

Anyone proposing to administer a local anesthetic should be familiar with the pharmacological behavior of the drug employed and be prepared to deal quickly with any untoward reactions.

1532 Tulane Avenue, New Orleans 12, La.

Postextraction syncope and spasm following nitrous oxide administration

H. A. Sahl. *J.Connecticut D.A.* 32:24-25 Oct. 1958

A 41 year old man had his maxillary left first bicuspid extracted under 15% N_2O analgesia. The tooth had been painful to percussion; a slight swelling and extreme soreness in the periapical region of the mucobuccal fold had been evident on palpation, and a roentgenogram had revealed a radiolucent periapical area and some bone loss.

At the onset of the extraction, the patient became noticeably tense. A short while after the extraction was completed, the patient rapidly began to lose color with the onset of syncope. Straight oxygen was administered, to no avail. The patient's pulse became thready. Amyl nitrite was administered and straight oxygen again was given. As no improvement became evident, 9 to 10 grains of caffeine with sodium benzoate was administered subcutaneously. Soon the patient's color started to return and he recovered gradually. Within five to seven minutes the patient had violent and uncontrollable tremors. Questioning revealed that, although the patient had no past history of convulsions, he had been subjected to severe mental and physical exhaustion due to the recent illness and loss of his mother while he was suffering unrelieved toothache.

A physician was called to attend the patient, and the symptoms of spasm were relieved within 15 minutes.

Postextraction syncope and spasm usually are restricted to patients who have been injected with a local anesthetic agent which causes an allergic reaction.

This case report points up the need for questioning the patient closely as to the state of his health and present condition before an operation is commenced, of accomplishing premedication or other indicated procedures, and of keeping in readiness emergency drugs and oxygen.

864 Hope Street, Springdale, Conn.

Methitural sodium (Neraval Sodium), a new ultra-short-acting anesthetic for dental surgery: preliminary report

Herbert A. Krasner. *J.Oral Surg.* 16:418-421 Sept. 1958

A study was undertaken to evaluate clinically a new agent of the thiobarbiturate group, methitural sodium (Neraval Sodium) in oral surgery. A 4 per cent solution of methitural sodium was administered to 344 unselected ambulatory oral surgery patients ranging in age from 9 to 80 years. For purposes of comparison, a 2.5 per cent solution of thiopental sodium was administered in the same manner to a group of 83 unselected ambulatory dental patients ranging in age from 12 to 68 years. All patients were premedicated with a combination of 50 mg. of meperidine and 1/100 grain of atropine.

Methitural sodium was found to be noticeably shorter acting than was thiopental sodium. Of the 344 patients who received the new intravenous anesthetic, 59.8 per cent left the office within one hour after the anesthesia was terminated. Of the 83 patients who received thiopental sodium, only 30.1 per cent were able to leave the office within one hour.

The incidence of postanesthetic headache, dizziness, nausea and vomiting was significantly less when methitural sodium was used. The prolonged narcosis frequently experienced with thiopental sodium was not noticed with methitural sodium.

Induction time with methitural sodium was slightly longer than with thiopental sodium. There was occasional brief coughing or transient hiccups during induction, but this could be virtually eliminated by a slower injection rate.

364 Franklin Street, Bloomfield, N.J.

Oral surgery

Treatment of fractures in edentulous jaws

Hermann Mathis. *Fortschr.Kief.Ges.Chir.* 2:92-96, 1957

The treatment of fractures in edentulous jaws requires methods different from those used in the treatment of fractured jaws in which complete or partial dentitions are present.

The technic of treating fractures in edentulous jaws with specially constructed dentures and extension attachments has been introduced by the School of Dentistry of the University of Vienna, and is now used frequently in clinics and practices in many European countries under the name "Vienna method."

Another method for treating fractures in edentulous jaws by extraoral splinting, invented by E. Becker, a veterinary surgeon, and modified by the author, is designed to reduce and maintain the fractured parts in as nearly a normal position as possible, thereby restoring function and facial symmetry. This splinting technic, simple in procedure and satisfactory in result, is used frequently at the Dental Clinic of the Free University of Berlin.

Metal screws are driven into the jaw fragments, by either the open or closed method, and the screws are joined by a string-binding with acrylic resin (Paladon M) which is formed with flexible tubes.

These metal screws, as many as possible—there can never be too many—are driven into the jaw fragments, spaced equidistantly. The free ends of the screws are painted with methylene blue to mark their position, before the flexible tube is used to form the acrylic string-binding. With a cofferdam perforator, holes are punched, the tube is brought into position, and the points for egress of the screws are designated clearly.

After the perforation is completed, female screws are inserted. Injury to soft tissues must be avoided. A metal tubule is attached to each screw. The flexible tube is again positioned properly and filled with acrylic resin. To obtain an uninterrupted flow (without air bubbles), a specially designed filling tube is used.

During the processing of the self-curing acrylic resin, the fractured parts should be kept in correct position temporarily by the assistant's fingers.

Clinical experience does not sustain the idea that infection of involved bones is necessarily concomitant with intraoral splinting. If the fragments are correctly stabilized, infection seldom occurs. This desirable stabilization is obtained by use of the metal-acrylic splint combination.

The appliance weighs only a few grams, and is at least as strong as the customary cast metal devices.

After complete healing of the fracture, the appliance is easily removed. The screws are removed with screw keys.

Similar appliances can be used when large cysts have been removed in edentulous posterior regions of the jaw to prevent pathologic fractures or when bone sections have been removed surgically. In such instances, the posterior fragments have to be immobilized until complete regeneration of osseous tissues has taken place.

That this method of extraoral splinting has not been employed more frequently seems to be the result of failure to recognize its numerous favorable features.

On the basis of the many satisfactory results obtained at the Dental Clinic of the Free University of Berlin, this method warrants the consideration of oral surgeons and more frequent application.

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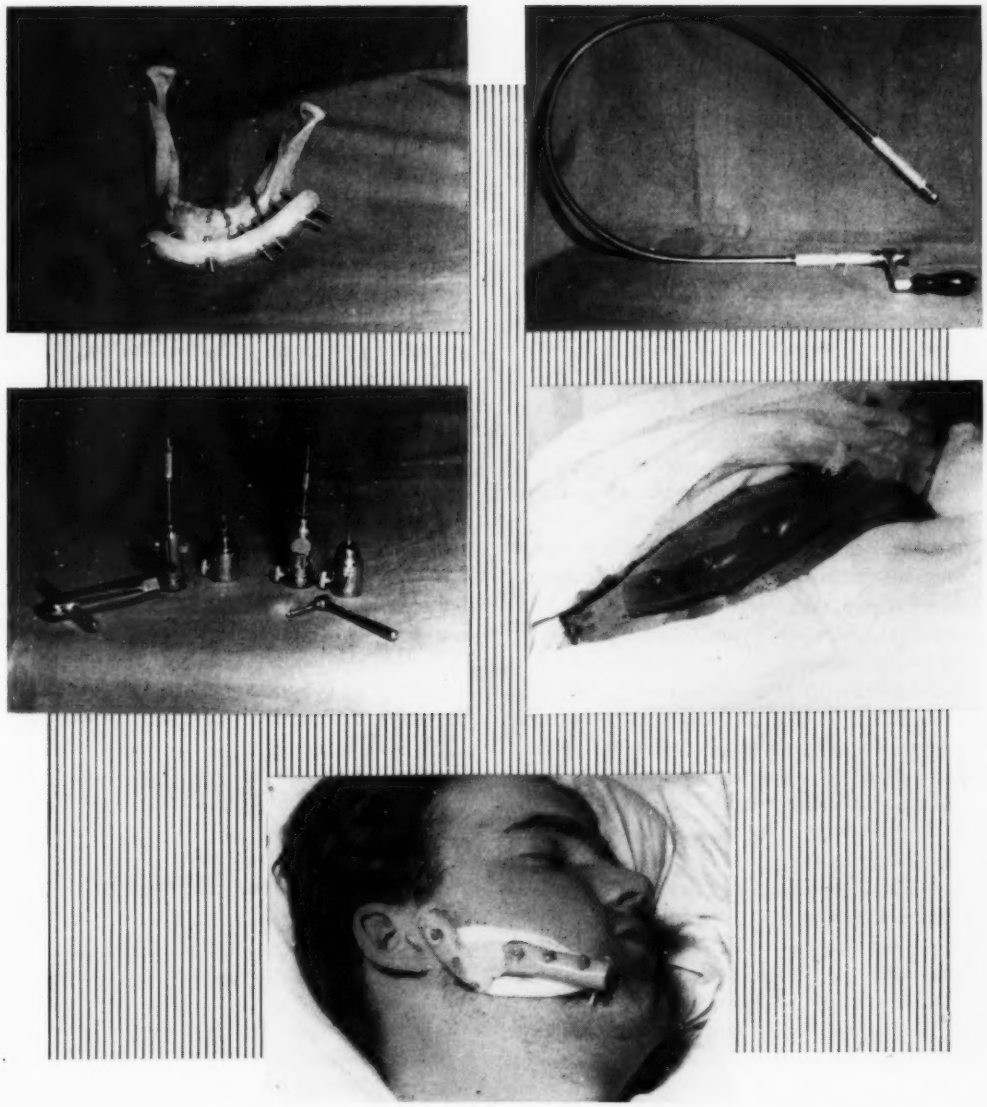

Above, left: Principal features of the appliance for extraoral splinting. Above, right: Crankshaft used to insert the screws. Center, left: Armamentarium used for extraoral splinting. Setscrews with spear drills, screws, platelets, sockets, the flexible tube and the screw key. Center, right: Acrylic string-binding in situ, kept in position by female screws. Below: Appliance in situ before adjustment or correction

What is nature's worst pain?

Lynn Poole. *Science Digest* 44:63-66 Aug. 1958

No pain ever experienced—toothache, headache, accidental or surgical wounds and fractures—can compare with the pain associated with tic douloureux (trigeminal neuralgia).

This nervous disease causes spasms of pain which strike its victim suddenly. The term "victim" is used deliberately because several persons afflicted with the disease have committed suicide rather than endure the agony.

The victim of trigeminal neuralgia usually is middle-aged or older. Suddenly, without warning, severe shooting pain strikes his jaw, races up his cheek toward his ear. The attack lasts from 10 to 15 seconds, but a dull ache remains in the cheek and jaw.

After a short time, the second attack strikes. The patient does not dare to move, fearing that even the slightest change in position might bring on another slash of pain. The attacks occur oftener and oftener.

The recurrence of the attacks is unpredictable; there may be a repeated series of pain within the next six months without apparent inducing cause. Each time the pain returns, the attacks become more severe and last longer.

Masticatory function, even the slightest motion of the facial or oral muscles such as are involved in speaking and toothbrushing, may trigger the recurrent pain.

The first branch of the fifth cranial nerve is called the ophthalmic division, and is seldom involved in trigeminal neuralgia.

The second branch, the maxillary division, sometimes plays a part in this condition, but the third branch, the mandibular division, is mainly responsible for the pain impulses which travel over the branch to a ganglion within the skull.

As early as 1500 A.D., attempts were made to treat the disease by surgical cutting of the facial nerves at the surface. Relief, however, was only temporary.

About 50 years ago, another type of operation was tried. The nerve was severed at a point behind the ganglion of the skull. Although the technic was improved, the patient sacrificed esthetic appearance and ability to perceive the sensations of touch, temperature, pressure, hearing and smell for alleviation from pain. The nerve-severed side of the face seemed dead and the face resembled a mask.

Relief from pain, associated with trigeminal neuralgia, may be obtained by injecting procaine hydrochloride into the trigeminal nerve. Some patients, however, find the injection into the nerve almost as painful as the attack. Many drugs have been tried. Quinine and iron preparations bring relief in a few instances. Various vitamins have been administered experimentally.

Quite by chance, a successful treatment was discovered. Stilbamidine (4,4′-diamidinostilbene) was found to be effective in multiple myeloma, blastomycosis and actinomycosis. After stilbamidine injections, the patients complained of numbness in their cheeks. This side effect, unwelcome in yeast-fungus diseases, would be desirable in trigeminal neuralgia. Experimental injections produced favorable results. After a series of injections, the attacks became less frequent and less severe. Many patients experienced no recurrence of pain for more than a year.

200 East Ontario Street, Chicago 11, Ill.

Tumours of the parotid gland: a histological study and results of combined surgical and radiological treatment

S. Bruzelius, E. Cederquist, F. Linell and F. Bergman. *Acta chir.scandinav.* 114:1-9 No. 1, 1957 [in English]

This report concerns 180 patients with parotid tumors treated by combined roentgenologic and surgical therapy between 1935 and 1950. Of the 180 patients, 131 had mixed tumors, 14 had muco-epidermoid tumors, another 14 had adenocarcinoma, 4 had cystadenolymphoma and 17 had unclassified tumors. One hundred eighteen patients had benign mixed tumors and 49 had malignant tumors. The remaining 13 patients had cystadenolymphomas and benign unclassified tumors which healed without complications and without recurrences. Of the 118 patients with benign mixed tumors, 81 received primary combined surgical and irradiation treatment at the

University Hospital of Lund, and were followed up for from 5 to 18 years; there were no recurrences. Seventeen patients had been treated primarily at other hospitals before referral; they were given combined surgical and irradiation treatment; 15 did not have recurrences but two did. These two patients were reoperated on and were given subsequent irradiation therapy; they then remained free from recurrences for 8 and 11 years, respectively.

Permanent paresis of the facial nerve occurred in nine of the patients who received combined therapy. Delayed healing was noted in 19 patients. Salivary gland fistulas which healed spontaneously occurred in six patients.

Except for superficial tumors readily movable under the skin, surgery was preceded by telegamma treatment. Surgical intervention was carried out three to four weeks later through an incision long enough to permit identification of the facial nerve and extensive removal of the tumor. The surgical specimen was examined histologically. If the diagnosis was one of benign mixed tumor, radium tubes were placed in the wound cavity.

Of the 49 patients with malignant tumors, 21 had recurrences on one or more occasions. The disease was fatal in 18 patients, and death occurred within five years in 14 of them. The treatment consisted of extirpation of the tumor with preoperative and postoperative irradiation. Because of the less encouraging results, the method of treatment was modified to total parotidectomy with neck dissection followed later by external roentgenotherapy.

University Hospital of Lund, Lund, Sweden

Bone regeneration following grafts with polyvinyl plastic sponge

Melvin H. Amler, Percy L. Johnson and Gerrit Bevelander. *Oral Surg.,Oral Med. & Oral Path.* 11:654-661 June 1958

A study was made of the reaction of bone to the implantation of polyvinyl plastic sponge. Adult albino rats, 350 days old, were prepared for operation under ether anesthesia. A diamond abrasive stone was used to prepare a trough in the dorsal aspect of the femur bone. A T-shaped section of autoclaved polyvinyl plastic sponge was inserted into the trough. Gut sutures were placed to encircle the circumference of bone and sponge. The right femurs were implanted with plastic sponge and the left femurs served as controls. In the control animals troughs were prepared but no plastic sponge was placed; gut sutures were ligated about the circumference. Animals were sacrificed after 1, 4, 12 and 24 weeks, and blocks of tissues containing the femur bone were removed, stained and studied histologically.

Where contact was established between the sponge and the marrow cavity, a structural attachment resulted between the parent basic bone substance and the new bone which infiltrated the sponge. This did not occur where the sponge was merely in contact with the freshly ground cortical surface of the bone devoid of periosteum.

Latticelike spaces within the sponge matrix became filled with connective tissue elements, ground substance, osteogenic tissue and calcified spicules. No foreign-body reaction was induced in the bone. Osteoclastic activity was observed about the interstices in the sponge, with consequent resorption and gradual replacement of the sponge material with bone. Twelve weeks after implantation the trabeculae were, for the most part, rebuilt into compact bone with haversian systems, except for small, uncalcified regions of plastic sponge which were incorporated into the bone matrix. In regions where the sponge remained, there was a singular absence of osteogenic activity; these regions constituted about 15 per cent of the original sponge implanted 12 weeks previously. No discernible difference could be noted in sections prepared from grafts left in place for longer intervals of up to 24 weeks.

The preliminary observations made in this study indicated that the use of polyvinyl plastic sponge grafts, as described, appeared to enable normal bone to grow and regenerate beyond the original contours of the bone.

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Extractions

Split bone technic in oral surgery with special regard to removal of the lower third molar

Gösta Forsslund. *Svensk tandläk.Tskr.* 50:561-571 Oct. 1957

The use of bone drilling in surgical procedures on the alveolar process has its disadvantages. It is difficult to prevent infection, heat is generated by the drilling, and the bur fails to provide clean, smooth surfaces. It would be an advantage if chisels were employed more commonly in bone surgery. The three types of chisels most useful in oral surgery are the mastoid gouge, the straight chisel and the osteotome.

A chisel, when driven with a mallet, moves slightly in the direction of its plane side (Fig. 1), according to the parallelogram of forces. To employ the split bone technic, one must be acquainted with the bone trajectories. The "grain" of the skull is shown in Figure 2. Use of a vertical stop cut can avoid unfavorable splitting. The practitioner must try to remove the bone in pieces, not in chips, in order to achieve "clean" surfaces.

The use of roentgenograms is of paramount importance in operations on the mandibular third molar region. Extraoral roentgenograms with occlusal films are required. The exposure should be made with the mandible protruded as much as possible, and the roentgenogram should include the region behind the third molar and its relation to the mandibular canal.

The surgical exposure of the bone is made with a curved incision carried anteriorly from the distal aspect of the second molar. This is continued distally over the operative field and is made with a pair of scissors (Fig. 3).

The following examples outline the procedure of bone splitting.

1. Vertical impaction (Fig. 4). With a straight chisel 3 mm. wide and the plane side turned mesially, a cut is made to penetrate the cortical bone. From the lower end of this cut, at an angle of 60 degrees, another cut is made distally with the plane side of the chisel turned upward. When the chisel has passed through the cortical bone it is twisted and the nearly rectangular piece of bone is removed. In vertical impactions, the point of attack for an elevator being the bifurcation, the operator must be careful not to remove too much bone in order not to lose leverage.

2. Mesio-angular or horizontal impaction (Fig. 5). A vertical stop cut is made with another cut at 45 degrees. The chisel is twisted so that a triangular piece of bone can be removed. In this instance the point of application for the elevator is mesially beneath the crown of the third molar. If the first cut does not give a favorable point of application for the elevator, the stop cut is elongated downwards and another crosscut is made parallel to the first one. Another piece of bone thus is removed, allowing adequate access.

3. Disto-angular impaction (Fig. 6). The method just mentioned may be employed, but if the tooth is in a distinct distal position, the following method is easier. Two vertical stop cuts, a and b, are made, followed by a cut, c, at about 90 degrees. The distal bone covering the tooth is removed with a cut, d. Where necessary, the cuts are repeated in the order a, b, c, d. The chisel is turned as in methods 1 and 2, with the plane side mesially and upwards, but in cut b the plane side is turned distally.

The bone that covers the tooth lingually can be split if the chisel is applied buccally against it and distally to the crown of the third molar. In mesio-angular impaction, this technic fractures the bone mesiolingually at the thinnest point, corresponding to the most lingual prominence of the crown. In disto-angular impaction, the chisel is applied mesially in relation to the crown of the third molar.

Figure 1 According to the parallelogram of forces, the chisel when driven with the mallet moves slightly in the direction of its plane side

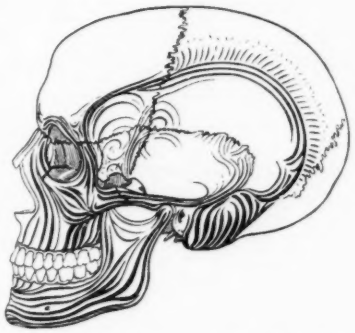

Figure 2 The "grain" of the skull

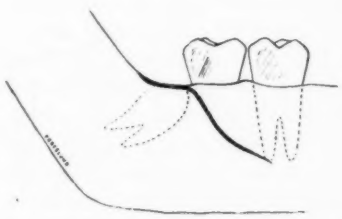

Figure 3 From the distal aspect of the second molar, a curved anterior incision is made and is continued distally over the operative field with a pair of scissors

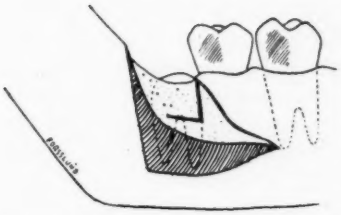

Figure 4 A vertical stop cut is made with another cut at 60 degrees

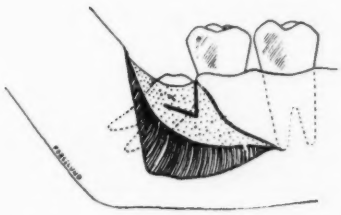

Figure 5 A vertical stop cut is made with another cut at 45 degrees

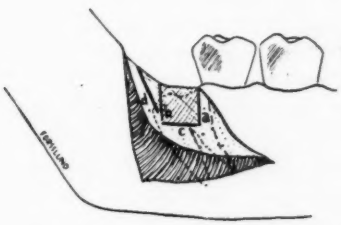

Figure 6 Two vertical stop cuts, a and b, are made, followed by a cut, c, at about 90 degrees. The distal bone covering the tooth is removed with a cut, d. Where necessary, the cuts are repeated in the same order

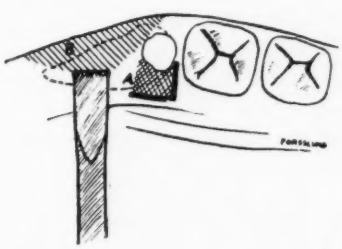

Figure 7 A represents the buccal bone which covers the tooth, and B the distal and lingual bone. The chisel is placed slightly out of vertical

If the third molar is deeper, in a mesio-angular position, and the operator is experienced in the split bone technic, both the distal and lingual bone can be removed in one piece (Fig. 7). A shows the buccal bone which covers the tooth, and B the distal and lingual bone. The chisel is placed slightly out of vertical. A chisel 5 mm. wide is used. The plane side of the instrument is turned laterally and with the edge parallel to the linea obliqua. When the chisel is driven down as far as necessary, it is taken up and turned with its plane side mesially and returned to the cut. The chisel will gradually change direction a little toward the lingual surface, but by simultaneously twisting the chisel the wedged fragment may be removed.

In most instances the impacted third molar can be removed intact. If it is desired to split the tooth, the osteotome is used. The tooth must not be luxated before it is split.

To make it easier for the patient to endure the pounding of the chisel, a small rubber block or a tightly wrung gauze bandage is placed between the two rows of teeth on the opposite side. After suturing is completed, a compress of sterile gauze is placed over the operated area to ensure hemostasis and to reduce dead space.

If the patient is over 50 years old, the decreased amount of bone trabeculae does not necessarily constitute a contraindication, but the operator must bear in mind that in such instances the drilling technic has its merits. The split bone technic may cause some degree of discomfort to the patient, but it can be carried out easily under local anesthesia if the surgeon uses care.

Sabbatsbergs Sjukhus, Stockholm, Sweden

Postextraction facial inflammation and edema treated by antibacterial drugs and streptokinase intramuscularly

Joseph M. Miller, John A. Surmonte, Milton Ginsberg and Frank B. Ablondi. *J.Oral Surg.* 16:306-309 July 1958

Recent clinical investigation indicated that inflammation and edema might be alleviated by the use of an antibacterial drug and streptokinase intramuscularly (Miller and others, 1955). In 64 patients with a wide variety of conditions associated with inflammation and edema, excellent results were obtained in 45, good in 17 and poor in 4. In the group were two patients with inflammation and edema after tooth extraction whose clinical course was influenced favorably by such treatment. The reports of these two patients are presented in detail, to indicate that this method of treatment might find a use among the dental profession for alleviation of postextraction inflammation and edema. One patient received 5,000 units of streptokinase-streptodornase in 0.5 cc. of physiologic saline solution intramuscularly twice a day for three days. The second patient received the same dosage for eight days.

Further investigation of the phenomenon is indicated.

Veterans Administration Hospital, Fort Howard, Md.

The effects of the retention of roots following tooth extraction

H. E. Simpson. *J.Canad.D.A.* 24:331-334 June 1958

When a root is fractured during the extraction of a tooth, the operator confronts a dilemma. He can remove the fractured root, sometimes at the cost of trauma and destruction of bone considerably in excess of the patient's expectations; or he can leave it in place and hope that no ill effects ensue. If the remaining fragment is large and accessible, there is little doubt as to the correct procedure. But if it is small and deeply placed, a decision is difficult, especially if the antrum or the inferior dental nerve may be involved.

When a root fragment is infected, its size is immaterial except insofar as a large, projecting root may produce traumatic effects on the adjacent gingiva, tongue or cheeks. In the absence of preoperative infection, however, size is a more important factor. The surrounding tissues are basically able to deal with a large root fragment as easily as with a small one, but larger fragments are more likely to project into the superficial part of the extraction wound.

Small root remnants deep in the wound generally are well tolerated.

An investigation into the healing of extraction wounds in Macaca rhesus monkeys, and a study

of the literature, resulted in the following conclusions:

1. A large root fragment should be removed even if the pulp retains its vitality, because the fragment undoubtedly will be uncovered fairly rapidly by alveolar resorption if it is not already projecting above the level of the bone.

2. Infected roots should be removed unless there are strong contraindications to this procedure.

3. Apical fragments of uninfected teeth lying deep in the bone and surrounded by normal tissues probably are harmless although they may be uncovered after many years by alveolar resorption.

Sutherland Dental School, Newcastle upon Tyne, England

Post-operative management of healing by second intention

W. J. Linghorne and Henry A. Thompson.
J.Canad.D.A. 24:281-286 May 1958

Through accident or by design, lesions of the jaws frequently heal by second intention, that is, other than by organization of a blood clot. A method is reported for managing postoperative lesions of the jaw where healing occurs by second intention.

Experiments with dogs were carried out to compare the healing of wounds of the jaws by first intention with the healing of similar wounds when filled with periodontal pack. It was observed that as much or more bone was regenerated when a periodontal pack was used than when a blood clot occurred. At various intervals up to 70 days, the periodontal pack was removed for examination of the wound; in all instances, the wound appeared to be healthy and granulating well. Healing appeared to be somewhat slower with a periodontal pack. On the basis of the animal experiments, it was decided to investigate the use of periodontal pack in the postoperative management of patients with jaw wounds that are healing by second intention. No controls were used.

Four case reports are presented. Three of the patients had extraction wounds. Treatment consisted of irrigation with normal saline, drying of the socket by aspiration, and dressing the wound with the Challies periodontal displacement pack. Relief of pain was obtained within minutes. After three days the dressing was removed and a new periodontal pack applied. The same procedure was followed weekly for one or two weeks, with satisfactory healing resulting. Advantages of the method are a reduction in undesirable sequelae, good control of pain, a reduction in the number of visits for postoperative care, and rapid healing.

Periodontal packs have been used widely after gingivectomy. The experimental data suggest the possibility that one dressing of periodontal pack could be adequate postoperative care for many instances of healing by second intention.

86 Bloor Street West, Toronto, Ontario, Canada

Viper venom for control of postextraction hemorrhage

William A. Wagner and Adrian O. Hubbell.
Oral Surg.,Oral Med.& Oral Path.
11:1118-1119 Oct. 1958

Viper venom (Stypven) is an effective hemostatic agent that converts prothrombin to thrombin in the presence of calcium. When viper venom is applied to oxidized cellulose (Oxycel) and placed in the socket of a recently extracted tooth, it will solve most instances of prolonged bleeding.

The following procedure has been found successful:

1. The region is injected with a local anesthetic to minimize discomfort.

2. All tissue debris and clotted blood are removed from the extraction wound.

3. Small pieces of oxidized cellulose are moistened with viper venom and placed loosely in the bleeding socket.

4. When indicated, sutures are applied to eliminate bleeding from the margins of the wound.

Favorable results can be expected only when the venom comes in direct contact with the bleeding area. The absorbable dressing should not be removed from the socket. If the dressing and clot are lost, a sedative dressing may be required to keep saliva and debris from causing discomfort until granulation occurs. Viper venom has the unusual property of arresting the bleeding without the formed clot losing its bright, fresh look.

123 Atlantic Avenue, Long Beach, Calif.

Public health dentistry

The trace element selenium and its influence on dental caries susceptibility

D. M. Hadjimarkos and Carl W. Bonhorst. *J.Pediat.* 52:274-278 March 1958

The possibility that trace elements other than fluorine may play a role, beneficial or harmful, on the degree of susceptibility to dental caries deserves more study. One of the outstanding findings of the authors' recent epidemiological investigations on dental caries among Oregon children was the existence of a direct relationship between urinary selenium concentration and dental caries prevalence. The results indicated that the trace element selenium may render the teeth more susceptible to dental caries attack.

A second investigation on the relationship between selenium and dental caries was undertaken among 79 high school boys living in the counties of Jackson and Josephine in Oregon. Previous studies had shown that children born and reared in the two counties showed a high degree of susceptibility to caries. The caries experience was similar in the two counties, 13.4 DMF teeth per child in Jackson County and 14.4 DMF teeth per child in Josephine County. Twenty-four-hour urine specimens were collected from the 79 boys. Analysis revealed that the mean urinary selenium concentration of the 33 boys from Jackson County was 0.074 ppm, and that of the 46 boys from Josephine County, 0.076 ppm. These values are regarded as being of considerable magnitude.

Selenium may be a factor responsible for increasing the susceptibility to dental caries attack. Additional studies are necessary to confirm the relationship suggested here, and to investigate the mechanism through which selenium may exert its harmful effects on teeth.

Dental School, University of Oregon, Portland, Ore.

The effect of sugar in various forms on the rate of spread of occlusal caries in the lower molars of rats

G. N. Davies and B. G. Bibby. *J.D.Res.* 37:570-580 Aug. 1958

The Vipeholm study suggested that sugar in solution is less cariogenic than sugar in a solid sticky form. Although this effect was apparent in relation to the initiation of dental caries, no clear deductions could be made concerning the effect of sugar in solution on the rate of spread of lesions already established. This experiment was designed to study this latter problem.

Osborne-Mendel strain rats were placed on a cariogenic diet until dental caries was detected in the occlusal surfaces of lower first or second molars. The rats were then assigned to different dietary groups for a specified length of time to determine the effect of sucrose in various forms on the rate of spread of established lesions.

The results suggest that there is no difference between the effect on the spread of caries of sucrose in aqueous solution and sucrose in solid form. But when sucrose was fed in the form of a carbonated beverage and as a dilution of orange juice concentrate, dental caries progressed at a significantly slower rate.

Eastman Dental Dispensary, Rochester, N.Y.

Treatment of patients with rampant caries

Bo Krasse. *Odont.Revy* 8:99-117 April 1957

The teen-ager who has more than 15 cavities a year and the older patient who has ten new cavities a year both belong in the category of those with rampant caries. The resistance of the enamel to caries can be increased by topical applications of a solution of 2 per cent sodium fluoride, and this always should be done.

Rampant caries activity can be reduced by: (1) preventing the formation of plaque material on the teeth by brushing the teeth not less than ten minutes after each meal; (2) using a medicinal tooth paste to prevent the formation of acid in the plaque; (3) changing the diet; (4) chewing each mouthful of food more times to stimulate the saliva secretion and mechanical cleansing

of the teeth; (5) rinsing the mouth after each meal with water which, if possible, should contain dibasic calcium phosphate, and (6) restricting the intake of carbohydrates by reducing the number of meals taken each day and the amount of carbohydrate at each meal.

Royal Dental School, Malmö, Sweden

National health service for Argentina

A. Schmunis. *Rev.A.odont.,Argentina* 46:45-49 Feb. 1958

The responsibility for the care of the health of the population rests with the federal government. Specific laws are required to regulate the national health services to provide medical and dental care free of charge. Such laws already have been passed and are functioning in several countries.

In some of the Latin American republics more or less complete programs dealing with national health services are initiated and called "National Health Security." In the United States, the Social Security program covers only the fields of old age and unemployment. Integral medical and dental care are not rendered free to all people because of the opposition of the professional organizations. Millions of Americans are covered by voluntary health and hospital insurance. Soviet Russia, however, provides to the people, free of charge, all the benefits of medicine and dentistry through a completely socialized system.

In Argentina, the great majority of the people cannot afford the expenses of medical and dental care as provided by private physicians and dentists. These important health services, rendered free of charge to all preschool and school children as well as to persons who are unable to pay, should be provided by the federal government as well as by local authorities. At present, medical (but not dental) care for the poor is supplied by charitable organizations but in an insufficient manner.

The program of a national health service, resembling procedures initiated long ago in several European countries (so-called "socialized" medicine and dentistry) would provide to persons of moderate economic means complete medical and dental care, if necessary free of charge. The free choice of physicians or dentists within the program should be safeguarded. The program, providing medical and dental care of the highest quality, should be financed by regular contributions of employees and employers and by periodic grants by the federal government which will control the program.

Physicians and dentists could join the national health service on a full-time or part-time basis. They could keep their private offices and practices if they desire to do so. They would form an integral part of the program, and their professional standards, dignity and ethics would be preserved and maintained. They also could obtain permanent positions within the program guaranteeing adequate remuneration, a secure future and a promotion to higher ranks regulated by a system of merit.

The establishing of such a national health service in Argentina would solve many of the existing health problems which involve at present the government, the medical and dental professions and the entire population.

Marcos Sastre 3553, Buenos Aires, Argent

Dental caries in man and laboratory animals: a comparison

Em. Stelling. *ORCA* 4:98-102 1957 [in English]

Experimental dental caries in rats, cotton rats and golden hamsters is compared with dental caries in humans, on the following points: teeth, oral environment, habits of eating, environment, carious lesions, susceptibility and etiology.

The microscopic structure of enamel and dentin in the laboratory animals does not differ from that of corresponding human tissues. In the animals as in man, the pulp develops secondary dentin. Although the chemical and physical properties of enamel and dentin in man and in the experimental animals cannot be compared in detail, the few investigations hitherto made indicate that the contents of organic material are higher in rat and hamster enamel than in human enamel. The calcium:phosphorus ratio is lower in rat and hamster enamel and dentin than in corresponding human tissues.

Hamster saliva, with a pH of 8.5, is more alkaline than human saliva. The bacterial mouth flora

of the laboratory animals does not differ from the human mouth flora.

Laboratory animals have different eating habits than humans.

Studies made in several laboratories show that environment may be a significant etiologic factor in caries in animals.

No differences have been found, macroscopically or microscopically, between the carious lesions in man and in these animals. The initial carious lesion in the animals, however, is most commonly located near the bottom of the occlusal fissures, and less commonly on the proximal or smooth surfaces.

The susceptibility to dental caries in man and in these animals seems to follow the same lines.

The results of the comparison may be summarized as follows:

The anatomical and physiological factors that constitute the basis for the initiation and development of dental caries in man and in rats and hamsters coincide in some respects and differ in others. In spite of this, the carious lesions are in all respects identical.

The results of investigations of dental caries in these animals constitute a valuable basis for caries research in man. Further extensive and methodical studies in these animals are entitled to occupy a more prominent place in caries research in man than hitherto.

Royal Dental School, Malmö, Sweden

Prescribing supplements of dietary fluorides

Council on Dental Therapeutics. *J.A.D.A.* 56:589-591 April 1958

Prescribing fluoride supplements is not a substitute for community fluoridation programs. None of the procedures for individual administration of fluoride supplements completely duplicates the situation which exists when the entire community water supply contains fluoride at the optimum level. Nevertheless, it may be desirable to prescribe fluoride supplements for young children in selected instances where there is strong motivation on the part of the parent and a clear realization of the need for careful regulation of the daily fluoride intake. The following principles should be observed:

1. Concentrated fluoride preparations should be dispensed only on prescription in order that adequate supervision may be provided for their safe, effective use.

2. Supplementary fluorides should be prescribed only when the concentration of fluoride ion in the drinking water is known and is less than 0.7 ppm.

3. Dietary fluoride should be available continuously throughout the period of tooth formation.

4. No more than 264 mg. of sodium fluoride should be dispensed at one time.

5. Concentrated fluoride preparations should bear the warning statement: "CAUTION: Store out of reach of children."

6. Prescriptions should be limited to those instances where the parent may be expected to follow directions carefully.

Use of a bottled water containing 1 ppm fluoride ion is most feasible during the first two years of life when substantially all drinking water is provided at home. This water is used also for the preparation of formulas and other food. Fluoride tablets may be employed with least difficulty in localities where the drinking water is substantially devoid of fluoride. The following prescription illustrates their use:

℞ Sodium fluoride tablets 2.2 mg.
Dispense 100
Label: Use according to written directions
CAUTION: Store out of reach of children

Written directions should be provided according to the age of the child as follows:

(1) Before two years of age. Add one fluoride tablet to each quart of water used for drinking purposes and for the preparation of formulas and other food.

(2) From two to three years of age. Every other day add one fluoride tablet to an amount of fruit juice or drinking water which the child will consume at one time.

(3) After three years of age. Administer one tablet each day in an amount of fruit juice or drinking water that will be consumed at one time.

When the drinking water is substantially devoid of fluoride, the aim is to provide supplements of about 0.5 mg. of fluoride ion per day for children from two to three years of age and about

1.0 mg. of fluoride ion per day beyond three years of age. These amounts should be reduced appropriately in prescriptions issued for children who live in areas where the drinking water contains fluoride ion at levels of 0.2 to 0.7 ppm.

The child should receive adequate fluoride until at least eight to ten years of age.

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Bacteriology of dental caries

J. B. MacDonald. *Internat.D.J.* 8:178-179 June 1958

The study by Orland and others (1954), in which it was established that caries cannot be produced in rats in the complete absence of bacteria, is a milestone in caries research and dramatic evidence of the key role played by bacteria in the carious process.

A second group of papers provides new evidence supporting the theory that the carious lesion is initiated by acid decalcification. Burnett (1951) and Burnett and Scherp (1951, 1953) examined the flora of human dental caries at three different strata. In enamel caries they found the flora to be composed essentially of aciduric microorganisms —lactobacilli, streptococci and others. They did not recover from these sites any bacteria capable of hydrolyzing the organic matrix of dentin. In the superficial layers of carious dentin, dentinolytic microorganisms were more numerous than aciduric microorganisms. In the deepest layers of carious dentin, where dentin was not yet decalcified, aciduric bacteria again predominated. Burnett found, furthermore, that dentinolytic microorganisms were incapable of hydrolyzing the matrix of undecalcified dentin. Shaw (1954) demonstrated that it was not possible to produce caries in rats in the absence of carbohydrate, even if the animals were desalivated. These findings suggest that lesions cannot be initiated by proteolytic microorganisms. Shaw found also that lesions already developed become arrested in the absence of carbohydrate from the diet. Apparently, even in the developed lesion progressive destruction is dependent on preliminary acid decalcification.

The work of Dreizen and Spies (1957) suggests that lesions can be initiated by acidogenic bacteria alone.

A useful experiment for the future, employing the germ-free technic, could be designed to establish clearly the mechanism by which teeth are decomposed. It would require oral inoculation of rats in a germ-free environment with a pure culture of lactobacilli or other acidogenic, nonproteolytic microorganisms. A second group of germ-free rats would be inoculated with a pure culture of a suitable proteolytic organism lacking fermentive capacity. A third group of germ-free rats should be inoculated with a combination of both the acidogenic and proteolytic microorganisms. On the basis of present evidence, it can be predicted that if the rats then were fed a cariogenic diet, the lactobacilli alone would produce decalcification without disintegration of dentinal matrix; the proteolytic species alone would be without effect, and the two together would produce caries.

This experiment would delineate the mechanism of caries production at least in the rat and would simplify the interpretation of many studies describing a variety of conditions modifying the carious process.

Harvard School of Dental Medicine, Boston, Mass.

Rural dental and medical health scheme

Editorial. *Pakistan D.Rev.* 8:22 Jan. 1958

A program to extend dental and medical care throughout the rural areas of Pakistan has been evolved by the health authorities of West Pakistan and of the Government of Pakistan. The program will require an expenditure of rupees 47 crores [$98,700,000] and will be spread over a period of 15 years, at which time it will require an annual budget of rupees 9.7 crores [$20,370,000]. This master plan has the prime object of making almost every kind of medical facility available to the agrarian Pakistanis who form the bulk of the population.

Under the scheme, the province of West Pakistan is divided into 1,000 rural units; a maximum of 40,000 persons will comprise one unit. Population is the basic factor in the scheme. Each unit is to have one main health center and three subcenters, responsible for health, sanitation and hygiene. The "Primary Health Units" will be

staffed by two medical officers, one lady health visitor and lesser staff. The subcenters under each unit shall be manned by one health assistant and a dai [helper]. Provision has been made to train the staff and personnel for these health units.

The Primary Health Unit will be backed up by a Tehsil [subdistrict] Headquarter Unit, which shall have a 36-bed hospital with a dental clinic attached. Two Class II medical officers, one Class II dental surgeon, one nursing sister, seven nurses, one assistant district health officer and lesser staff shall run each Tehsil Headquarter Unit. Each District Headquarter likewise is to be provided with enlarged dental and medical facilities, including a 100-bed to 125-bed hospital, and an appropriate staff of specialists in medicine, dentistry and surgery.

Many more dentists will be required. Considering that hundreds of subdistrict hospitals are envisaged over the next 15 years and that the present output of the Dental College at Lahore is insufficient, more dental teaching and training institutions must be set up immediately in the province of West Pakistan. Hyderabad would be one of the suitable places, and so would Rawalpindi.

26, The Mall, Lahore, Pakistan

Public health service in Bulgaria

Edmund Banaschewski. *Zahnärztl.Praxis* 9:180 Aug. 1, 1958

In the "People's Republic" of Bulgaria, the public health service, initiated in 1951, provides medical and dental care free of charge to the entire population. One of the more doubtful aspects of socialized medicine and dentistry is the increasing degree to which the government, acting as the guardian of all citizens, assumes full responsibility for public health and welfare, and in return imposes innumerable restrictions and regulations.

The parental attitude of the government and its agencies differs from that of human parents in that the government never considers an individual citizen to be in a fit condition to take care of himself, his family, his occupation, or his health and that of his family. The citizen's liberties disappear as the "well-meaning" attitude of governmental agencies increases.

Certain benefits for the population arising from the socialized public health service, however, accompany governmental health programs.

Before World War II, the requirements for dental and medical drugs, instruments and materials could be met only by expensive importation. Today, the government-controlled pharmaceutical industry is able to produce drugs of equal quality but less cost, in adequate quantities. The Bulgarian industry will make available dental instruments and materials within one or two years.

Although the number of dental and medical personnel still falls short of the requirement, there has been an increase in the number of physicians, dentists, pharmacists and their assistants. In 1944, there were 3,516 physicians, 824 dentists, 695 pharmacists and 814 medical, dental and pharmaceutical assistants, some of them inadequately educated. In 1956, there were 9,469 physicians, 2,316 dentists, 1,118 pharmacists and 9,967 medical, dental and pharmaceutical assistants. All members of the first three groups were college-educated and those of the fourth group were trained in professional high schools. The population, according to the 1953 census, was 7,500,206.

The majority of practicing dentists and physicians, mainly associated with government-controlled hospitals, clinics, polyclinics and school clinics, are over 50 years old, and there exists no compensating recruitment of graduates. This is a significant educational factor which must affect inevitably the survival of the Bulgarian public health service in its present form.

The number of preschool and school children examined annually in school dental clinics increased from 9,459 in 1944 to 12,847 in 1956. About 6,000 of these children had to be referred to the clinics of dental colleges for orthodontic or oral surgical treatments. More than 2,000 children were treated in the school dental clinics and are now free from carious lesions and masticatory defects.

Recently, the Bulgarian Public Health Service has initiated a program which emphasizes dental health education and preventive dentistry.

A satisfactory and close relationship between public health officers and members of the dental profession is and always has been a characteristic feature of the public health service in Bulgaria.

13b München-Gräfelfing, Germany

Orthodontics

Importance of apical base in orthodontics

H. J. L. Smeets. *Tschr.tandheelk.* 65:225-240 April 1958

About 1920, two new orthodontic concepts were presented which, although apparently unrelated, proved on closer investigation to counterbalance each other.

The "apical base," a term introduced by Lundström, can be regarded as the clinically discernible part of the "basal arch," a term introduced by Bluntschli.

Scientifically, the apical base appears to be far more important for orthodontic treatment planning than the basal arch.

The clinical importance of the apical base has already been acknowledged by many authors (Chapman, Chateau, Demisch, Hotz, Schwarz, Salzmann, Korkhaus, and others) as the determining factor indicating whether expansion or extraction therapy should be employed. Success of these treatment methods frequently depends on the size and position of the apical base.

According to Heath, three types and three subdivisions of the apical base in both jaws should be considered prior to initiating orthodontic treatment:

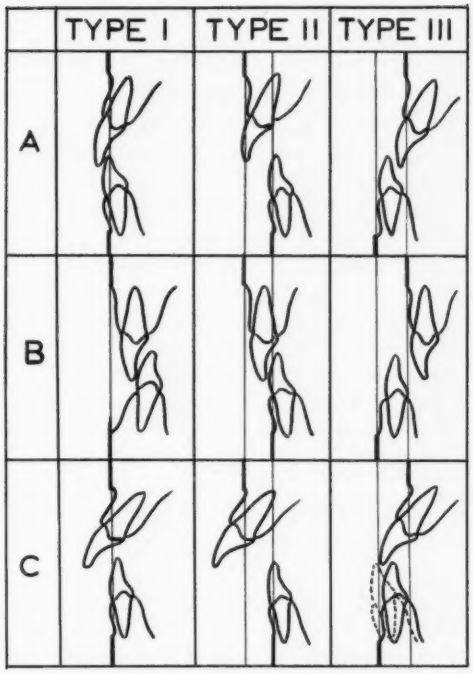
Type I. The apical base of the upper jaw lies at the same sagittal level as that of the lower jaw.

Type II. The apical base of the upper anterior plane extends beyond the limits of the apical base of the lower anterior plane.

Type III. The apical base of the upper anterior plane lies behind the apical base of the lower anterior plane receding in a sagittal direction.

The three subdivisions of each type are demonstrated in the graphic schema (see illustration).

Prior to orthodontic treatment planning, the axial direction of the anterior teeth of both jaws—which is different in each type and subdivision—should be considered.



Classification on the basis of the sagittal relations between the apical bases of the upper and the lower anterior plane. Types I, II, and III; subdivision A, B, and C

According to each type and subdivision (based on Heath's classification, modified by the author) the following treatment methods are recommended:

1. Type I, subdivision A: systematic extraction therapy (Hotz) in both jaws is indicated.

2. Type I, subdivision B: expansion therapy to increase the vertical dimension between jaws by modification or repositioning of the anterior teeth (bite raising) is indicated. Extraction therapy is contraindicated.

3. Type I, subdivision C: extraction therapy in the upper jaw, sometimes combined with vertical extension therapy, is indicated.

4. Type II, subdivision A: reciprocal tooth repositioning is the method of choice. Extraction therapy is contraindicated.

5. Type II, subdivision B: vertical extension therapy to obtain increase in dimension is indicated. Extraction therapy in the lower jaw is permissible but never in the upper jaw.

6. Type II, subdivision C: extraction therapy in the upper jaw is indicated, combined with in-

sertion of an orthodontic appliance to move the upper anterior teeth in a distal direction.

7. Type III, all three subdivisions: extraction therapy in the lower jaw is indicated combined with modification of the upper anterior plane in a forward direction. This will provide a harmonious relation between both apical bases.

The graphic schema provides the orthodontist with the basic principles for indication or contraindication of extraction and expansion therapies, which A. Martin Schwarz called "the highest points in orthodontic achievement."

Orthodontische Kliniek, Rijks-Universiteit, Utrecht, The Netherlands

Relapse in orthodontics

K. T. Adamson. *Internat.D.J.* 8:304-305 June 1958

From 1951 to 1956 not a single article devoted to the subject of relapse in orthodontics was published. Is this because most orthodontists do not follow up their patients for a period sufficiently long enough after the appliances have been removed to see the end result?

Tweed, in one of the most controversial articles ever written (1944), stated that success was achieved in only 20 per cent of his patients. Orthodontic journals should contain many more articles such as this; it is not so much from the successes but from an honest appraisal of failures and from current research work that the orthodontist can hope to arrive at facts and not mere suppositions.

The science of orthodontics has been handicapped by the publication of numerous articles containing a large number of dogmas which have been advanced and accepted as facts although they are incorrect.

On many orthodontic problems there is a world-wide divergence of opinion. Such problems include extraction versus nonextraction, the changing form of the human face and dentition, the treatment of closed bite, muscle patterns, the relative merits of removable and fixed appliances, and orthodontic terminology.

The solution calls for the appointment of a number of international committees, each with a selected chairman and each covering a particular section of the specialty, to report at each quinquennial International Dental Congress.

The hope of reducing the percentage of relapses lies in a better understanding of etiology and a general improvement in orthodontic technic.

University of Melbourne, Melbourne, Australia

Relation of the nasal and subnasal components of facial height in childhood

Howard V. Meredith, Virginia B. Knott and Ernest H. Hixon. *Am.J.Orthodont.* 44:285-294 April 1958

Conflicting views on facial development indicate the need for more research on the form of the human face. The relation between the nasal and subnasal components of facial height was studied in 27 boys and 28 girls for whom roentgenograms were available at successive annual ages from 4 to 12 years. These children had not received orthodontic treatment. An additional group of seven children who had received "bite opening" therapy also was studied.

Longitudinal data were compiled, using the following index:

$$\frac{\text{Nasal height}}{\text{Subnasal height}} \times 100$$

On the average, the nasal component of facial height increases in relation to the subnasal component. Nasal height in relation to subnasal height may remain practically constant from age to age, or it may increase as much as 15 percentage points.

In the 55 children studied, nasal height in relation to subnasal height varied from 65.0 to 79.8 per cent at the age of four years, and from 68.3 to 91.4 per cent at the age of 12 years.

At the age of six years 10 per cent of the children had indices below 69.2, and 10 per cent had indices above 80.4. At ten years of age, 30 per cent of the indices were below 75.5, 40 per cent were between 75.5 and 80.6, and the remaining 30 per cent were above 80.6.

In general, variability increases with age. The range (highest value minus lowest value) is 14.8 percentage points at the age of four years,

19.9 percentage points at the age of eight years and 23.1 percentage points at the age of 12 years.

In the seven children treated orthodontically there was produced a temporary increase in subnasal height and consequently a temporary decrease in the percentage relation of nasal height to subnasal height.

State University of Iowa, Iowa City, Iowa

Some problems in the treatment of aplasia of permanent upper laterals

Harry Sundling. *Svensk tandläk.Tskr.* 51:491-511 Aug. 1958

A general rule for the treatment of aplasia of the maxillary permanent lateral incisors cannot be established. The disadvantages of prosthetic treatment of young people are so evident that any therapy that makes bridgework unnecessary is preferable.

Eighty-seven case reports of patients with 119 instances of aplasia of the maxillary permanent lateral incisors, treated at the orthodontic department of the Eastman Institute at Stockholm, were taken at random and studied. Spontaneous space closing had occurred in 68 instances. In 40 instances the space was closed by means of an appliance, and in only 11 instances was the space widened to make place for a bridge.

Factors that influence the plan of treatment include the age of the patient, shape and size of cuspids, the axial inclination and mesial migration tendency of bicuspids and cuspids, occlusion, apical base, size and function of lips and tongue, the development tendency of the jaws and the occlusion.

A prophylactic extraction of deciduous teeth seems to give good results in certain types of patients with contraction tendencies. A careful analysis of each patient must be the foundation of treatment.

In patients in whom it is anticipated that the germ of the permanent cuspid will migrate mesially, it is advisable to extract the deciduous cuspid from two to three years before it would normally be shed.

It is doubtful if the extraction of only the deciduous cuspid can bring about the—in certain patients—desired mesial migration of the cuspid and bicuspids. In patients with Class I malocclusion with an obvious contraction tendency and a suitable axial inclination of the teeth, an early extraction of the second deciduous molar at the eruption of the first molar gives a better result than extraction of the deciduous cuspid. The same effect in some instances can be obtained by grinding the distal surface of the second deciduous molar.

The most difficult problem in treating children with aplasia is in deciding whether a contraction tendency exists and in estimating the development of the occlusion and future growth.

Six case reports illustrate the afore-mentioned principles and the effect of treatment.

Klostergatan 11-13, Örebro, Sweden

Operative dentistry

Tongue and cheek protector

Hans Killian. *D.Echo* 28:73 Aug. 1958

Working with thin separating disks in close interstitial spaces frequently injures the patient's tongue or cheek.

A new tongue and cheek protector, invented by the author, provides full protection of the endangered areas. Only one instrument is required for working on both sides of the upper and lower jaws.

Although the protector has been designed primarily for the lower jaw, it can be used on the upper jaw without modification.

Instrumentation is simple. Before the instrument is applied, two thin cotton rolls are inserted in the customary manner on the side of the jaw to be treated. The instrument's handle should point to the patient's ear during insertion.

The patient is asked to bite slightly on the instrument, holding the protector in position. Sometimes, however, the patient will open his mouth spontaneously after the instrument is inserted and will fail to hold it with his teeth. The instrument, out of correct position, will tilt slightly forward, preventing adequate protection for the tongue and the cheek. Slight turning by finger pressure will put the instrument again in the desired position. The patient is then ordered to hold it firmly between his teeth. Experience proves that most patients become accustomed easily and quickly to this procedure.

The advantages of the new tongue and cheek protector are as follows: (1) the complete protection it provides for the soft oral tissues; (2) simple manipulation during cavity preparation; (3) the complete absence of discomfort of patients even if longer sitting time is required; (4) the firm enduring construction; (5) the rust preventive property (it cannot be affected by moisture or saliva); (6) the resistance against the damage by sterilization (steam under pressure, dry heat, boiling water or chemical solutions), and (7) the comparatively low cost of the protector.

The instrument has been in use at several German dental clinics as well as in private dental practice and was found practicable for prosthetic, endodontic and orthodontic procedures.

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Relationship of age to pain in dental operative procedures with rotating instruments

Fred Herzberg. J.*Gerontol.* 13:167-168 April 1958

A study was made of the pain reactions in patients of various ages in dental operative procedures using rotary instruments with an air-water spray without local anesthesia. Each patient determined and reported his pain reaction.

Some 2,352 cavity preparations were performed on 847 patients ranging in age from 3 to 80 years.

The incidence of pain reactions was lowest in the early age groups. From age 25 to age 50 the incidence of pain reactions was remarkably constant. Sex appeared to exert no influence on pain reactions. Females showed 33 per cent no pain, 54 per cent moderate pain and 12 per cent pain. Males showed 32 per cent no pain, 58 per cent moderate pain and 9 per cent pain.

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Acrylic fillings

Österr.Zschr.Stomat. 55:392 July 1958

Q. Since I started to use self-curing acrylic resin as a filling material, I have observed beneath several restorations deeply seated decalcification and softening of the dentin. Is it possible that the self-curing methyl methacrylates lack the necessary affinity to dentin or do they incur different thermal expansions? Does the freed acrylic acid produce decalcification of dentin?

A. Polymerized self-curing acrylic resins contain a liquid monomer and a polymer (a long chain molecular arrangement of the same proportion of chemical elements as the monomer). Regardless of the polymerization process used, properly inserted acrylic fillings will not induce chemical reactions leading to the decalcification of dentin. The residual monomer, an insignificant factor in dental practice, cannot produce the described effect. Proper lining with silicate cement will insure the success of the restoration. If no carious dentin remains beneath the acrylic filling, inadequate fitting and sealing of the cavity can be responsible for the described failure. A working knowledge and an understanding of the physical properties of the acrylic resin used are prerequisites for successful acrylic restorations. Failures in indication and technics may lead to serious complications but hardly to decalcification or softening of dentin. Adequate toilet of the cavity and the prevention of contamination are important. Foreign material left along the cavity walls may lead to discoloration and inadequate adaptation of acrylic fillings.

Placement of acrylic fillings in the mouths of patients who do not practice oral hygiene is contraindicated.

Dental College of the University of Göttingen, Germany

The reaction of metal oxides with o-ethoxybenzoic acid and other chelating agents

Gerhard M. Brauer, Eli E. White, Jr., and Manuel G. Moshonas. *J.D.Res.* 37:547-560 June 1958

The presently available commercial zinc oxide-eugenol mixtures harden rapidly only in the presence of accelerators. The products have low compressive strength. The materials inhibit the polymerization of acrylic monomers. Hence, acrylic resins will not polymerize in direct contact with these materials. The reaction of zinc oxide with a number of commercially available chelating agents was studied. A large portion of this report deals with the products obtained from mixtures of zinc oxide with *o*-ethoxybenzoic acid (EBA) because they appeared to be the most promising for dental use.

Mixes of zinc oxide with many compounds capable of forming chelates result in coherent products. Mixes containing *o*-ethoxybenzoic acid, salicylaldehyde, acetylacetone, *o*-ethoxyacetic acid or lactic acid form hard products within one hour at room temperature. Some of these products disintegrate in water.

EBA and oxides of group IIB (zinc oxide, cadmium oxide, mercuric oxide) and those tested in group IIA of the periodic table, as well as lead oxide, harden rapidly.

Solutions of EBA and eugenol, when mixed with zinc oxide, have a short setting time. The products show a noticeable increase in compressive strength. Water solubility and density of the product increase.

Addition of quartz powder further improves the physical properties of the hardened material. The products may be of interest as dental impression pastes or temporary fillings.

National Bureau of Standards, Washington 25, D.C.

Air hygiene in dental practice

Heiner Hoffman.
Oral Surg.,Oral Med.& Oral Path. 11:1048-1054 Sept. 1958

The dentist carries on many activities and procedures which involve risks of aerial transmission of disease. Because the dentist works so close to his patient, such common activities as talking, coughing and sneezing involve a greater risk of direct exchange of oral and pharyngeal microorganisms than in ordinary interpersonal relationships. In addition, certain dental procedures may be the source for infective droplets and droplet nuclei.

When the front teeth of a patient are subjected to short blasts of air for one minute, blood agar plates held directly in front of the mouth will show an average of about 170 colonies, of which about 70 per cent are alpha hemolytic streptococci. The remainder consist of *Staphylococcus pyogenes* var. *albus* and nonpathogenic spore formers. The air blast itself, unless a filter is used, will contain bacteria from the room air.

If bur shavings are blown out from a cavity preparation with a blast of air, blood agar plates held directly in front of the mouth will show counts of between 6 and 400 colonies per plate. The organisms found here are largely alpha hemolytic streptococci, nonhemolytic staphylococci, yeasts, lactobacilli and neisseria.

When water spray from the dental unit is applied for 20 seconds against the mouth, blood agar plates exposed in front of the mouth show an average of 500 colonies per plate. These are mostly alpha hemolytic streptococci and staphylococci. It appears that water spray may result in a considerable number of microorganisms being thrown out of the mouth into the air of the room. A glass slide held ten inches before and slightly above the mouth for less than five seconds while lesions of necrotizing ulcerative gingivitis are washed by a water spray will show a great many large spots consisting of a mat of *Borrelia vincenti*. The spray may readily be felt by the patient on his face and by the dentist on his arms.

It is probable that the breathing space of the dentist is invaded by the aerosol created by the use of the water spray in the mouth. The bowl with running water used for disposing of the patient's saliva at the dental chair may be an additional source of aerosol production. The front of the clothing of the dentist becomes contaminated from the mouth, nose and throat flora of the wearer as well as from the patient.

Although the face mask has been recommended occasionally for the mutual protection of the patient and the dentist, the conventional type of surgical mask is surprisingly inefficient. The purely deflector mask, consisting of a solid sheet of clear transparent plastic, held over the operator's face, may be the most suitable in dental practice.

When operative procedures permit, the use of a rubber dam is an effective means for preventing the spraying of the patient's saliva. The dentist can control his own production of salivary aerosol by minimal and soft speaking and by using a face mask.

To some extent, the bacterial and allergenic contamination of air in a room may be controlled by some form of air conditioning.

Ultraviolet irradiation is especially effective against the microorganisms ejected from the mouth and upper respiratory tract. The cost of such an installation is nominal. A single 30-watt germicidal lamp is adequate for a floor area of about 200 to 300 square feet. The cost of operation, including lamp replacement and amortization of the original cost of the lamp, was in 1949 about $1 a month.

Other means of controlling air contamination include disinfectant vapors, dust suppression and the use of germicidal floor waxes. An air temperature of between 68° and 72° F., with moderate or natural humidity, should be maintained. Relative humidity alone in the narrow intermediate range around 50 per cent is lethal to air-borne mi-

croorganisms. Humidities above or below this range have no such germicidal effect.

The bibliography lists 37 references.

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Newer methods of cavity preparation

James R. Jensen and William F. Braasch.
J.Wisconsin D.Soc. 34:145-149 July 1958

The standard cutting speed used by dentists for years for all procedures involving the rotary principle has been in the range of from 4,000 to 6,000 rpm. At this speed, without a coolant on the cutting instrument, the dentist can operate without causing appreciable pulp damage through frictional heat. The dentist can control the pressure on the instrument and the time the bur contacts the tooth for each cut. At the standard speed of from 4,000 to 6,000 rpm, the vibrations transmitted to the patient by the moving parts of the pulley system and handpiece are of a frequency and amplitude that produce maximum irritation to the patient.

An increase in the rotational speed of the equipment will not eliminate vibrations, but it can place them in a frequency and amplitude range above the patient's perception. Thus, accelerated speed can relieve one of the disagreeable factors of cavity preparation for the patient.

Each dental instrument cuts at its optimal efficiency at a given speed. Instruments, such as round burs, which have seemed inefficient when used in the range of 4,000 to 6,000 rpm have proved to be very efficient at speeds in excess of 100,000 rpm. Research institutions now are conducting studies to determine the optimum speed for each design and composition of instrument. Generally, the higher the speed, the smaller the instrument needed for efficient cutting. The use of smaller instruments with increased speeds facilitates the ease of cutting, and eliminates the need for many burs and stones designed for specific cuts. This reduces the number of time-consuming changes of cutting tips during instrumentation. Cavity access, removal of enamel and dentin, and blocking out the entire preparation now may be accomplished with a single bur. The advent of increased speeds has created a need for new instrumentation in cavity preparation, but it has not changed the ideals of cavity preparation.

Although speeds in excess of 100,000 rpm are advantageous in the removal of bulk enamel and dentin, or of old metallic fillings, slower speeds still have their place. The speed range of 12,000 to 15,000 rpm is preferred for small cavity preparations as commonly found in the Class I, III and V lesions, and for the more delicate parts of larger preparations. For the removal of deep caries, polishing, or for finishing cavity margins with disks and polishing stones, speeds of 1,000 to 6,000 rpm are desirable.

Perhaps the simplest and least expensive method of increasing speed is to vary the pulleys from the motor to the handpiece. A large pulley may be placed at the motor terminal, if the motor can handle the additional load. When the speed is increased at the beginning of the system, ball bearing idler pulleys should be installed to reduce the frictional resistance which in turn would reduce the rpm. Pulley systems are available to be placed either on the motor or handpiece. A clean belt adjusted to proper tension helps to deliver maximum performance. The speed of rotation can be reduced from 17,000 rpm to 7,000 rpm by belt tension alone.

Other means of achieving high speeds include the use of high-speed handpieces and contra-angles, and water turbine and air turbine units. The possibilities of improvement of the turbines have not been exhausted. Future turbines probably will have attributes already attained by the ultra-speed mechanical handpieces—more torque and less maintenance.

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Hospital dental service

Operative dentistry performed in a hospital under general anesthesia

Kenneth R. Gibson and Robert H. Chase.
J.Michigan D.A. 40:242-244,250 Oct. 1958

Since 1954 the authors have performed operative dentistry and minor oral surgery on 189 patients under general anesthesia, in the James Decker Munson Hospital in Traverse City, Mich. Some 553 teeth were restored and 1,039 teeth extracted. Of the 553 restorations, 123 were of compound amalgam and the remainder were simple amalgam and synthetic porcelain restorations. Fifteen immediate dentures were placed. The patients ranged in age from 3 to 70 years, and fell in the following categories: children who were unmanageable in the dental office; children for whom the amount of dental work to be done was so great as to indicate it could be done best in the hospital; patients who had been advised, for medical reasons, to have the work done under general anesthesia; adult patients who would not have the necessary work done under a local anesthetic; adult patients who required multiple extractions, and patients who required dental work and already were scheduled for a general anesthetic for another procedure outside the dental field.

In 1954 the hospital accepted the recommendation of the Grand Traverse Dental Society that a private room be converted into a dental operating room. The room is equipped with a modern unit, motor chair, cabinet, sterilizer and mobile x-ray machine. Although other necessary equipment and instruments are available, it has proved advantageous for the dentist to bring a kit of his own "pet" instruments, matrixes and filling materials.

There is space for the anesthetist to sit at the left of the patient while he is in the dental chair, and for a stretcher to be rolled up to the right side of the dental chair. The right arm of the chair is removable, to facilitate moving an anesthetized patient to or from the stretcher. A McKesson rubber bite-block no. 868 for children and a no. 878 for adults are recommended.

The patient can be admitted to the hospital the night before the operation, or may come to the hospital as an outpatient 30 minutes before the operation.

Anesthesia is administered by a trained anesthetist. Children usually are administered thiopental sodium by rectum while in the anteroom, and are brought into the operating room after they are asleep. Adults usually have induction by thiopental sodium intravenously after they are in the dental chair. Patients are maintained on a gas-oxygen mixture administered through a small mask over the nose or through a tube passing through the nose into the trachea. Atropine is given preoperatively, usually with the first injection of thiopental sodium. The throat always is packed to prevent the accidental swallowing or aspiration of debris. The atropine provides a dry field. With the aid of the mouth prop, operative work can be done by quadrants. Surgery is done after the operative work has been completed.

After the dental operation, the patient is taken to a recovery room and left with other postoperative patients under the supervision of a nurse.

Although there is a charge—similar to an operating room charge—for use of the dental room, the dental room is a financial loss to the hospital.

Dentists at this hospital are not staff members, but the dentists determine who shall have the use of the dental facilities, and requisition the purchase of supplies and equipment, and check on patients' records. In cooperation with staff physicians, rules have been established relative to the admission of patients, physical examination prior to administration of general anesthesia, and the availability of anesthetists. Dentists are given the choice time on the operating schedule (7:30 A.M.). Most dentists who use the hospital facility assert that the arrangement is fair and satisfactory

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Prosthetic dentistry

Occlusal registration and grinding

Niels Brill. *Tandlaegebl.* 6:369-380
June 1957

In the edentulous patient, the muscles determine the various positions and movements of the lower jaw. Under normal physiological conditions the muscles are adjusted in such a way that the condyles usually are placed in intermediate positions rather than in extreme positions.

By employing a combination of centric occlusion and the common recording position of centric occlusion with ensuing centric grinding, the dentist can obtain good function in complete dentures.

Acrylic recording bases made on duplicate models are used. Wax is used for the biterim in the upper jaw, but on the posterior third of the recording base no wax is employed. In the middle third of both sides, the biterim has an extension of about 6 mm. on the occlusal surface. In the section comprising the cuspids and anterior teeth, the biterim is cut off at a slant from the lingual side, to make an "incisal edge."

In the mandible, a biterim is constructed of a compound material to make a sharp edge occlusally. In the anterior and buccal areas, enough compound is removed so that the middle third of the biterim is raised at least 3 mm. above the remaining edge. Before the most retruded position of the mandible is recorded, part of the upper biterim, 3 mm. deep, is heated to above melting temperature. This technic makes it unlikely that the biterims will change position, either vertically or horizontally, in relation to the supporting tissues.

When the finished dentures are placed in the patient's mouth, the prosthodontist uses articulating paper and grinding to determine the pattern of movement. The preponderance of contact on the protrusion facets of the teeth often can be observed (illustration, left). This is due to the fact that the muscles tend to bring the mandible anterior to the retruded position in which the occlusal surfaces have been placed.

Both the marking with articulating paper and grinding must be continued on both sides until the patient informs the dentist that he feels comfortable. Retrusion facets should not always be ground, even though they carry marks. A patient may place too heavy pressure on the protrusion facets. In that event, the dentures are displaced in relation to each other (illustration, center), and the retrusion facets are brought into contact with each other. A well-ground occlusal relation permits the mandible to attain a retruded position as well as the habitual one without risking any movement of the dentures on the supporting tissues (illustration, right).

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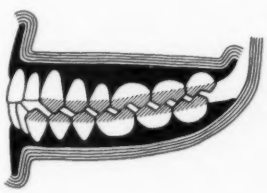

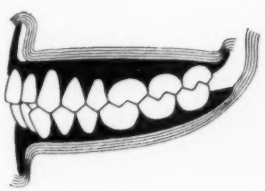

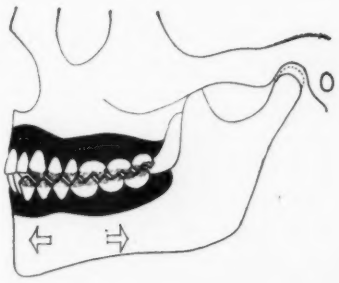

Five hundred eighty-four foreign bodies removed from the esophagus: a statistical study

E. S. Ray and P. P. Vinson.
Virginia M. Monthly 85:61-64 Feb. 1958

During the last 20 years the authors have treated 933 patients who had foreign bodies in their air or food passages. This report is concerned with 584 patients in whom the foreign body was located in the esophagus.

Contrary to general belief, foreign bodies in the esophagus are found more frequently in adults than in children. Of the patients whose records were reviewed, 269 were less than ten years old and 315 were older. The youngest patient was two months old, and the oldest was 94 years old.

Edentulousness seems to be a major factor in the impaction of foreign bodies in the esophagus. In edentulous adults, inadequate mastication and the loss of oral sensation resulting from wearing artificial dentures are responsible for food impaction.

Dentists should warn their patients of this hazard, when partial or complete dentures are inserted, and should explain that care must be taken in preparation and mastication of food. This applies especially to hash, chicken a la king served in a salad or a pie and to chops. Removable dentures, partial or complete, should not remain in the patient's mouth during sleep. Several of the patients examined had swallowed dentures while they were asleep.

Foreign bodies most frequently lodge in the upper third of the esophagus. Painful deglutition and passage obstruction are the most common symptoms. Because the majority of foreign bodies in the esophagus are not revealed by roentgenoscopy, diagnosis must be made from the history and esophagoscopy.

When a foreign body nonopaque to roentgen rays is suspected in the esophagus, barium should not be used as contrast medium for localization; iodized oil obtains better results. An esophagoscopic examination should be made immediately. General anesthesia increases the comfort and safety of instrumentation.

Pre-existing lesions in the esophagus are frequently responsible for the lodgment of foreign bodies, especially in the lower third of the musculomembranous canal between pharynx and stomach. Whenever a foreign body is encountered in this location, the esophagus should be examined thoroughly before and after the removal of the impacted particle. Impaction of foreign bodies, especially a bolus of meat, at the site of a previously existing stricture may reduce the blood supply. This can result in necrosis and rupture of the esophageal wall. Dilation of an esophageal stricture should be postponed for at least one month after removal of the foreign body to permit healing of ulceration and re-establishment of circulation. A foreign body that passes the oral cavity, the alimentary canal and the esophagus usually reaches the gastrointestinal tract and may be expelled spontaneously. In such instances, passage through the stomach may be delayed, but surgical removal is seldom indicated.

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The polymerization of self curing acrylics under air pressure

H. F. Atkinson and J. K. Harcourt.
Australian D.J. 3:183 June 1958

Tests were carried out on the various brands of self-curing acrylic resins currently available, to determine if there were any advantages in processing them under increased air pressure.

In the first series of experiments, disks of material were prepared in small, open, circular plaster molds. Sodium alginate solution was used as a separating medium. Two specimens were produced from each mix. One was allowed to harden normally under atmospheric pressure, while the other was placed in an air pressure chamber and immediately pressurized to 30 to 35 psi. As soon as the specimen at atmospheric pressure had hardened, the chamber was depressurized and the second sample removed and examined.

Of five different samples, four failed to harden properly under increased air pressure, the surface being soft and tacky on removal from the chamber, and the acrylic resin being flexible. On standing in air the acrylic resins hardened and became visibly more porous than when first removed from the chamber. All four materials,

whether hardened at atmospheric pressure or at 30 psi, showed evidence of porosity. Specimens of one sample hardened only in the air pressure chamber and also were practically nonporous, but the bench-prepared specimens of this material were only slightly porous and there was no visible difference between the two.

The specimens processed under air pressure were all distinctly yellow as compared with specimens made under atmospheric pressure. Pigmented materials also showed a pronounced change in color when polymerized under increased air pressure.

In a second series of experiments, repairs were undertaken at atmospheric pressure and in an air pressure chamber at 30 psi. There was no significant alteration in the transverse strength of the repairs when the specimen was polymerized under increased air pressure.

There appears to be no advantage in using an air pressure chamber for processing self-curing acrylic material, as the porosity is not reduced or the strength enhanced. Furthermore, increased air pressure results in discoloration of the material.

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Use of an aluminium casting alloy for constructing denture bases

D. J. Neill. *D.Practitioner* 8:382-386 Aug. 1958

The use of "super purity" aluminum for constructing bases for upper complete dentures has been advocated by several writers. For the past two years, the department of dental prosthetics of Guy's Hospital Dental School has successfully used a commercial grade of aluminum alloy containing 5 per cent magnesium and conforming to the specification LM 5. Although this aluminum alloy is inferior in strength to chrome-cobalt or gold alloys, it is three times stronger than acrylic resin and, if used only for plate types of construction, gives excellent results. In hardness, aluminum alloy again is inferior to the other metals used in denture construction but it is more than twice as hard as acrylic resin in the cast state, takes a higher polish, and irregularities can be removed without destroying its close adaptation to the tissues. Both strength and hardness in aluminum alloy can be increased by the anodic film which may be imparted to this material.

The aluminum alloy is by far the lightest of the metallic bases. A denture cast in aluminum alloy weighs about the same as one constructed entirely of acrylic resin. This aluminum alloy has a high thermal conductivity and is resistant to corrosion in the anodized state.

This material is capable of fabrication by casting into partial dentures of limited design. Although these alloys are not sufficiently strong to permit their use in a skeleton construction, they are strong enough to be used in the form of plates.

However, there are two outstanding objections to the use of this aluminum alloy in partially edentulous patients: (1) the possibility of amalgamation between the aluminum of the base and the mercury from new dental restorations, and (2) electrochemical corrosion of the base material in the presence of gold and amalgam fillings. It thus is necessary to restrict the use of aluminum alloys to edentulous mouths, and they are used to best advantage in the construction of upper complete dentures where a metal base is indicated but where retentive factors are unfavorable.

The technical problems involved in handling aluminum alloy are considered and details of the method of construction and the finishing of aluminum denture bases are presented.

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Improved phonetics in denture construction

Leslie R. Allen. *J.Pros.Den.* 8:753-763 Sept.-Oct. 1958

Neglect of the phonetic factor in denture construction may be attributed to the fact that most edentulous patients tend to return to normal speech after a postinsertion practice period lasting from several days to several weeks. A variety of oral inaccuracies occur during this practice period, the most common being the mispronunciation of the S and SH sounds. Although faulty speech is tolerated as part of "getting used to" the denture, it embarrasses the patient and adds to his burden of physiologic adaptation to the denture. An investigation was undertaken to develop a procedure in denture construction which

would enable the patient to speak clearly at the time of insertion of the denture.

Palatograms (tracings left by the tongue on an artificial palate constructed of acrylic resin) were made on a group of dentulous persons who had normal speech and represented a variety of tooth arrangements, tooth occlusion, arch form, arch size, vault form and vault height. A study of the palatograms indicated that no two persons contacted exactly the same area in pronouncing a given consonant, but that a sufficient similarity existed to constitute a pattern. The patterns for the T, D, N and L sounds were not distinct; that is, it was not possible to look at a palatogram and determine which of these consonants had been pronounced in making the tracing. However, the pattern for these consonants as a group was distinct, so that it was possible to look at a palatogram and be certain that either T, D, N or L had been pronounced.

The patterns for the S and SH sounds were similar and constituted a distinct pattern. The pattern for the S sound begins about in the area of the lateral incisors and bilaterally includes most of the posterior alveolar area. The pattern for the SH sound begins about in the cuspid area and bilaterally includes all of the posterior alveolar area and some of the vault. In a study of the S and SH palatography, it was noted that the rugae area was contacted slightly in some instances and not at all in others, but that in all instances the entire posterior alveolar area always was contacted. The rugae area was involved only slightly in the pronunciation of T, D, N and L.

The area most sensitive to thickness is the anterior alveolar area from cuspid to cuspid. An addition of 1 mm. of thickness in this area made speech awkward and indistinct; an additional 1 mm. of thickness in the posterior alveolar area made speech awkward but not indistinct. The entire vault area could be thickened up to the tongue palatal tracing line without interfering with speech.

To develop a normal S and SH tongue palatal pattern in the waxed maxillary trial base, usually it is necessary to thicken the area outlined by the palatogram. In most instances it is necessary also to thicken the area of the incisive papilla to prevent the jet of air emitted by the median sulcus of the tongue from escaping toward the vault. It was found that building the tongue palatal contact area to normal and thickening the area of the incisive papilla facilitates proper enunciation and eliminates much of the postinsertion practice period.

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On the properties of flexible dentures: a theoretical and experimental survey

Kalervo K. Koivumaa. *Suomen hammaslääk.toim.* 51:79-92 April 1955

A few years ago, synthetic materials of a nylon type were introduced as baseplate and clasp material for dental prostheses. The elasticity and possible changes in shape of a denture base are matters of the greatest importance to the teeth and the tissues that come into immediate contact with the denture. This prompted the present report of the behavior of the elastic prosthesis *in situ*, and of the bending properties of test pieces made of Prothenyl. Prothenyl, like ordinary nylon, is a soft elastic material with a high tensile strength and a specific gravity of 1.13.

The experiments showed the Prothenyl denture material tested to be elastic. Test pieces returned to their original form after a minor flexion, but after a major flexion the return to original shape was not complete. The extent and permanence of the bend depend on the extent and duration of bending. The test pieces did not break on bending.

When planning the construction of dentures from flexible material, the special properties of the material with reference to the static distribution of masticatory force must be borne in mind. Specifically, when Prothenyl is used, the permanent changes produced by flexion of the plate, the effect of such changes on the fit of the denture, and the strain produced on the tissues all must be taken into account.

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Pathology

Surgical parotitis

R. K. Gilchrist and J. R. McAndrew. *A.M.A. Arch.Surg.* 76:863-867 June 1958

Surgical parotitis is an acute inflammation of the parotid gland, either unilateral or bilateral, occurring most frequently after surgical procedures. Although surgical parotitis is an infrequent complication, it is alarming when it does occur. In the past it has carried a high mortality rate.

The patient developing parotitis usually is seriously ill, in poor general condition, dehydrated, undernourished and with an unsatisfactory oral hygiene. A dry mouth and a decreased salivary secretion seem to be the principal precursors to the onset of the disease. The infection almost always is caused by *Staphylococcus pyogenes* var. *aureus*. The diagnosis is easily made by finding an enlarged, tender gland. The onset usually is four to six days after operation.

Seven instances of surgical parotitis were seen by the authors within the past two years. All but one of the patients were acutely ill after extensive intra-abdominal surgery, and all were on antibiotic therapy when the parotitis developed. All patients were treated with roentgen rays as an emergency procedure within the first 12 hours after the onset of symptoms and immediately on making the diagnosis. The dosage was 75 r to the gland tissue daily. One patient responded to roentgenotherapy alone within 48 hours. In the remaining six patients, when it appeared within 48 to 72 hours that the swelling and pain were progressing despite roentgenotherapy, surgical incision and splitting of the parotid capsule was done under local 0.5 per cent procaine hydrochloride anesthesia. A hockey stick incision was started just anterior to the ear, and extended 1 inch to a point just below the angle of the mandible, and then forward below and parallel to the mandible for 1 to 1.5 inches farther. The parotid capsule was split a distance of 1 to 2 inches without incising the gland. No pus was obtained by needle aspiration in any instance. The wound was loosely packed with iodoform gauze, and warm compresses were applied for from two to three days. Relief from pain occurred almost immediately, and swelling was reduced within the first three to four hours.

In the six patients, recovery occurred during the next three to four days. Postoperative scarring was minimal. One death occurred in this series, on the eighteenth postoperative day, of resistant staphylococcus infection and septicemia; the parotitis had subsided in the meantime.

Resistant *Staph. pyogenes* var. *aureus* infections are becoming a serious problem in hospitals. When the microorganisms are present, more instances of surgical parotitis can be expected as a postoperative complication. Oral hygiene should be stressed during the first six days after abdominal surgery in patients who are seriously ill from inflammatory conditions.

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Central osteoclastoma or giant cell tumor of the jaw

Valerian Popesco and Maria Pavlovici-Ghinea. *Stomat.,Bucharest* 5:59-68 March 1958

During the last seven years, 2,170 patients with benign and malignant tumors of the jaws were treated at the Clinic of Maxillofacial Surgery of the University of Bucharest, Romania. There were 22 instances of giant cell tumor and 234 instances of giant cell epulis.

Giant cell tumor—the preferred term is central osteoclastoma—seldom occurs in the jaws. If it occurs, young adults are most likely afflicted. The tumor usually is benign, caused or influenced by trauma which promotes the formation of giant cells in the granulation tissue.

Giant cell tumor should not be grouped indiscriminately with giant cell epulis. Both are different disease entities. The main difference is that in central osteoclastoma the giant cells are more regular in size, larger and contain more nuclei than those in giant cell epulis.

Clinically, an increasing swelling as a gradual expansion of the alveolar bone is observed. In the upper jaw the developing tumor tends to invade the maxillary sinus. After the cortical bone becomes resorbed, the protruding tumor is covered only by a thin layer of mucoperiosteum. Hemorrhage occurs frequently. Paroxysmal pain (resembling facial neuralgia) is the main complaint. The teeth adjoining the growing tumor tend to separate and loosen.

At the clinic two treatment methods for this tumor are used: (1) surgical excision and thorough curettage, and (2) roentgenotherapy or teleradium irradiation. In severe instances (suspicion of malignancy) these two methods are combined.

Clinica de Chirurgie Buco-maxilo-faciala, University of Bucharest, Romania

Malignant tumors of the maxillary sinus

J. Vondra and J. Vinduška.
Ceskoslov.Roentgenol. 11:35-40
Dec. 1957

Early diagnosis of carcinoma of the maxillary sinus is extremely difficult. The sinus may be invaded from the upper alveolar bone or from primary tumors of the ethmoid bone. The tumor causes a continued purulent discharge which is mixed with blood. Patients usually do not seek treatment until pressure symptoms appear and the pain becomes unbearable. In advanced instances, the bony walls of the sinus are expanded and finally destroyed.

The present study, carried out at the Oncological Institute of the University of Prague, Czechoslovakia, deals mainly with the clinical and roentgenological problems of early diagnosis. Most of the patients with carcinoma of the maxillary sinus, observed at the institute, were referred by dentists who, fortunately, were able to recognize the symptoms. In most instances, the upper jaw showed a general swelling of the alveolar process and seemingly insignificant bulging on the hard palate. The teeth were loose and the oral mucosa ulcerated. In all instances, the initial symptoms were pains of various types radiating from the oral cavity to other parts of the face.

Metastases occurred seldom, probably because malignant tumors of the maxillary sinus produce fatal complications so early that they do not have sufficient time to metastasize. Recovery from advanced carcinoma of the maxillary sinus is rare.

Transillumination and customary roentgenography often yield negative results because of the concealed or deceptive characteristics of these tumors. Body section roentgenography (tomography) is recommended. If malignancy is suspected, immediate biopsy is indicated.

The prerequisites for an early diagnosis of tumors of the maxillary sinus, and for a differentiation between benign tumors or cysts and carcinoma, are as follows: (1) cooperation between dentists, physicians, roentgenologists, oral surgeons and oncologists, and (2) follow-up examinations of patients in whom roentgenographic examinations have yielded negative results.

Oncological Institute of the University of Prague, Czechoslovakia

Adenolymphoma of the salivary gland

J. E. Kahler and E. C. Pallette.
California Med. 88:425-428 June 1958

Although adenolymphoma of the salivary glands is considered an uncommon tumor, it has been observed in nine patients treated at St. Vincent's Hospital in the past decade. Unique is the fact that two of the patients were brothers. The elder brother, aged 63 years when the adenolymphoma was excised from the right parotid gland, had been aware of its presence for four years. The tumor measured 4 by 2 by 2 cm. Later in the same year, the younger brother became aware of symmetrical parotid enlargement; and three years later, when he was 61 years old, adenolymphomas were removed from both parotid glands. The tumor from the left gland measured 2 by 1.6 by 1.2 cm.; that from the right, 1.8 by 1.2 by 1 cm. The brothers recalled that their father, several years before his death at 82 years, had had bilateral parotid enlargement, but as he had carcinoma of the colon, the parotid tumors were not excised nor was biopsy done.

The great majority of adenolymphomas of the salivary gland are single, uninodular masses. Six

per cent of all reported parotid tumors are adenolymphomas. They occur predominantly in males, in a ratio of 4.5 to 1—even 10 to 1 in a large series (Martin and Ehrlich, 1944). The incidence is equal on either side of the neck. The youngest patient reported as having the disease was two and a half years old; the oldest, 92 years. The highest incidence is in the fifth to seventh decades.

The majority of the lesions occur as well-encapsulated, dark reddish-gray or red-brown tumors, often resembling an enlarged, congested lymph node. The capsule is delicate and transmits the color of the contained tissue. About a third of the tumors are partly or wholly cystic with flaccid or tense capsules; the remainder are solid and have the consistency of a lymph node.

Complete surgical excision including a thin rim of gland tissue adjacent to the tumor capsule results in cure of a "typical" adenolymphoma. Most of the reported cures have been accomplished in this way. The number of adenolymphomas treated roentgenologically is too small to judge the effectiveness of such therapy.

2131 West Third Street, Los Angeles 57, Calif.

Periapical granulomas or chronic periapical abscesses caused by hair embedded in the oral mucosa

H. Röckl and E. Müller. *Derm.Wschr.* 136:912-919 July 1958

A periapical granuloma is a chronic inflammation occurring around the apex of a tooth. A chronic periapical abscess resembles a granuloma in pathology and localization, except that suppuration occurs in its center.

Both conditions are either caused by or associated with pulpitis or gangrene, and the inflammatory processes of the periodontal membrane or the gingiva.

Animal or human hair, deeply embedded in the oral mucosa, was determined as the causative factor of periapical granulomas or abscesses in dental patients who belong to such occupational groups as barbers, butchers, milkers and farmers. Most of these patients had severe lesions of the mucous membrane, probably caused by wounds, mycoses or lacerations. Most of these granulomas or abscesses occurred between the lateral incisors and cuspids in either jaw.

The embedded hair acted not only as a foreign body but as a carrier of pathogenic bacteria and fungi which produced massive death of tissue. In instances in which the hair had penetrated deeper tissues, epithelized fistulas appeared.

Even after successful, usually conservative, treatment, a periapical granuloma, abscess or fistula recurred, obviously caused by newly embedded hair producing inflammatory tissue reactions.

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"Lumpy jaw"

J.A.M.A. 167:2260 Aug. 30, 1958

Q. The best cow of a dairy farmer's herd has "lumpy jaw." The lesion is still closed. How much are the farmer's chances of contracting actinomycosis of the jaws increased? How urgent, if at all, is it for the farmer to remove the affected cow now or later when the lesion is draining?

A. So far as we know, actinomycosis is not transferred from animal to animal or from animal to man. The causative microorganism, *Actinomyces bovis,* is an obligate parasite of animal or man and has never been isolated in nature. Although it is conceivable that pus draining from open sinuses could contaminate feed with granules that other animals may ingest and, thereby, cause an actinomycotic infection, there has been no known instance of an infection being caused this way.

535 North Dearborn Street, Chicago 10, Ill.

Glandular cheilitis: a precancerous condition of the lower lip

Pierantonio Wiel. *Riv.ital.Stomat.* 12:1583-1592 Dec. 1957

Glandular cheilitis is a chronic affection of the lower lip, usually caused by hypertrophy of the accessory salivary glands or their ducts. It is characterized by swellings and secondary inflammatory symptoms.

The disease occurs in adults of Italian or Spanish descent and has not been observed in persons

of Nordic ancestry or in the colored races. In the Italian dental literature only one case report appeared in which the occurrence of glandular cheilitis in a child was described.

The swelling usually begins at the middle third of the lower lip, gradually spreading externally and involving the line of contact between the lower and the upper lip. Dark red patches appear on the mucosa which surrounds the enlarged orifices of the glandular ducts. Slight pressure produces the secretion of a clear fluid.

In the later stages, the lower lip projects forward, and vesiculation and desquamation of the epithelium occur. In this stage, the disease, sometimes associated with leukoplakia, must be regarded as a precancerous condition. The swelling often interferes with speech and masticatory function.

The change from a benign to a malignant condition is difficult to recognize on clinical examination. Biopsy as a diagnostic procedure is recommended.

Via A. Tolomei 14, Padua, Italy

Nondevelopment of the tooth germ of a permanent cuspid: report of case

E. Bonorden-Schäfer. *Zahnärztl.Welt & Reform* 59:271-272 May 25, 1958

Severe jaw infections, osteomyelitis, jaw fractures, oral cysts and tumors produce malformation of the jaws, bone scars and resorptive processes in the developing tooth germs. These disturbances in the development of tooth germs may later prevent normal eruption and lead to tooth displacement. Nondevelopment of tooth germs, however, is rarely seen in dental practice.

In the case reported, the patient, a nine year old girl, was referred to the Dental Clinic of the University of Marburg/Lahn, Germany, for surgical elimination of an impacted deciduous left upper cuspid.

Full-mouth roentgenograms revealed the absence of the tooth germ of the permanent left upper cuspid. Local causes, such as accidental trauma or infection, may lead to nondevelopment of an isolated tooth germ.

Caution and patience are important in dealing with such a condition. Little is lost by letting natural forces take their course. The defect will have more esthetic than functional consequences. After surgical removal of the impacted deciduous cuspid, prosthetic restoration can be carried out at a later date.

Zahnärztliches Institut, University of Marburg/Lahn, Germany

Malignant tumors of the oral cavity and the nasopharynx

J. Zange. *München.med.Wschr.* 99:1936-1938 Dec. 20, 1957

Carcinoma of the oral cavity and the nasopharynx is of vital importance. Among fatal diseases, malignant tumors are second to heart diseases. Out of all cancer deaths, oral and pharyngeal tumors account for 4.8 per cent in men and 1.2 per cent in women. The dentist may be the first to observe the initial symptoms.

In the complicated problem of the cause of malignant growth, including oral and pharyngeal tumors, the following factors must be considered: the role of heredity, the virus theory, the enzymatic factors, the effect of extrinsic carcinogenic substances, the influence of sex hormones, damage caused by roentgen, radium, and actinic rays and trauma arising out of chronic irritation.

Carcinomas are malignant epithelial tumors in which the cells show an atypical arrangement with varying degrees of differentiation.

Increased difficulties in mastication, swallowing and nose breathing, otitis media causing deafness and closure of the eustachian tube, cervical adenopathy, and unilateral trigeminal neuralgia—any one of these conditions, singly or in combinations—may be the initial symptoms of carcinoma of the oral cavity or the nasopharynx.

If these symptoms—indicating the presence of a concealed oral or pharyngeal tumor—were kept in mind by dentists, physicians and oral surgeons, early diagnosis would be facilitated, and immediate surgical removal of the malignant new growth and the surrounding tissues would not only prevent metastases but would yield more favorable cure rates. Unfortunately, these diagnostic possibilities are not adequately utilized. Recent progress in roentgenotherapy and surgery,

therefore, cannot compensate for the lack of early diagnosis.

The author's maxillary approach, exclusively employed at the clinics of the University of Jena, Germany, permits full observation of the operation field, easier removal of the tumor (even if the sphenoid and pterygoid bones are involved), and yields a favorably esthetic result.

Between 1931 and 1950, 51 patients with oral or pharyngeal carcinoma were treated at the clinic; nine by radical surgery (the author's method) and 42 by roentgenotherapy. From the nine surgical patients, six have survived beyond the five year limit without tumor recurrence. Two patients have been found free of symptoms and complaints after more than 20 years.

From the 42 patients, treated by roentgenotherapy, only two can be considered as cured.

Lessingstrasse 2, Jena, Germany

Facial sinuses secondary to pulmonary tuberculosis

W. C. Mellor and C. R. Stockdale. *Lancet* No. 7037:62-64 July 12, 1958

In three patients referred to the department of oral and dental diseases of Crumpsall Hospital for the treatment of discharging sinuses on the face, investigation led to the diagnosis of unsuspected pulmonary tuberculosis. The first two patients complained of a "dental abscess" after a tooth extraction; the third complained of a swelling similar to a dental infection. None had pain.

A 33 year old man had had an "abscess" in the maxillary left bicuspid region eight months previously. He had recently experienced dyspnea and coughing. On the left cheek, about 1½ inches distal to the angle of the mouth, was a depressed scar surrounding a sinus from which watery, straw-colored pus was discharging. The dental condition was poor. *Staphylococcus pyogenes* var. *albus* and *Staph. pyogenes* var. *aureus*, sensitive to penicillin, were cultured from the sinusal pus. The patient's teeth were removed and the sinus on the cheek explored; it appeared to end in the alveolar bone in the maxillary left bicuspid region. The sinus did not heal. The temperature charts showed a "swinging" pattern like that seen in a tuberculous infection. Roentgenograms of the chest showed effusion at the base of both lungs and granular mottling throughout both lung fields, with some cavitation at the apexes, suggestive of pulmonary tuberculosis. The sputum contained acid-fast and alcohol-fast bacilli, and pus from the sinus yielded tubercle bacilli, in pure culture. When the patient was seen 12 months later, after medical treatment, the sinus had healed and the scarring was much reduced.

A 22 year old man was referred for a submandibular swelling. Four weeks previously the mandibular left second molar had been extracted because of an acute alveolar abscess. The submandibular swelling had then increased in size. Midway along the left side of the mandible and below its lower border was a fluctuant area, about 2 cm. in diameter, surrounded by an area of fibrous tissue. The overlying skin was hyperemic and there were signs of a partially healed sinus. Tuberculosis had been diagnosed in the first patient, and in view of the similarity of the lesions, the second patient also was referred for a chest roentgenogram, which revealed a tuberculous appearance in the left lung. With appropriate medical treatment, the sinus healed rapidly.

The third case report was similar to the first two.

It can be assumed that the lesions of the jaws were secondary to those of the lungs, but the route of infection is debatable. In the first two patients, retained roots and carious teeth were present, allowing ingress of bacilli. The three constant factors in the three patients were that all had active pulmonary tuberculosis, pathways from mucous membrane to skin existed and opened up a route of infection by sputum, and a typical and easily recognizable facial lesion developed.

In the treatment of dental conditions, care should be taken to prevent external sinus formation, and to maintain a healthy oral condition during treatment, even if this necessitates extensive conservative treatment of the teeth and gingivae.

Crumpsall Hospital, Manchester 8, England

Periodontics

Cartilage grafts in human periodontal pockets

Erwin M. Schaffer. *J.Periodont.* 29:176-182 July 1958

Can new bone be formed around and within cartilage grafts in periodontal pockets in man? Will the new attachment after grafting be coronal to the old attachment? Will any given individual accept a homograft of cartilage in the periodontium? Is there any difference in the rate of wound healing? A clinical investigation was undertaken to answer these questions.

In 26 patients, ranging in age from 18 to 56 years, 70 homografts of cartilage were done. The cartilage, taken from the noses of other patients after submucous resections, had been preserved in 70 per cent ethyl alcohol and stored in a refrigerator for from 7 to 90 days. The graft was placed in the wound after the new attachment operation in periodontal pockets. Of the 70 pockets treated, 41 were supracrestal and 29 subcrestal. The results of the grafts were determined by measuring the depth of the pocket before and after treatment and by recording the amount of recession that occurred. Roentgenograms were taken to determine the effect of the grafts on the alveolar process.

The cartilage was tolerated by the recipient tissues and there was no apparent foreign body reaction. Some new attachment coronal to the previous attachment was obtained in 60 of the 70 grafts. The new attachment varied from 0.5 mm. to 6 mm. Recession occurred after the treatment in 55 of the 70 instances, varying from 0.5 mm. to 4 mm. The pockets before grafting varied in depth from 3 to 12 mm.; after treatment, they varied in depth from 1 to 7 mm. After grafting, pockets with depths of from 4 to 7 mm. still existed in 15 instances. However, the sulci measured 3 mm. or less in 55 of the 70 pockets. Eight of the 70 grafts degenerated because of shortcomings of the operator.

The host tissue will accept and tolerate homogeneous cartilage grafts.

Some clinicians and researchers assert that it is dangerous to remove the epithelium in periodontal pockets because it may result in an increase in pocket depth. This was not evident in this study; in only two instances did the bottom of the pocket move apically from its former site. The new attachment in most instances completely offset this.

This study was not a controlled study; this type of treatment with grafts was not compared with the new attachment operation without grafts. Therefore, it is impossible to express an opinion on whether the grafting is an aid or a hindrance in attaining a new attachment.

School of Dentistry, University of Minnesota, Minneapolis, Minn.

Quantitative evaluation of the effect of balneotherapeutic procedures in treatment of periodontal disease

Ulrich Hermann and Alexander Schoeffler. *Schweiz.Mschr.Zahnhk.* 68:493-498 June 1958

For more than ten years, patients with periodontal disease have been referred to various European spas where they have received balneotherapeutic treatment.

Several authors, recently Weissenfluh, Schroeder, Mühlemann, and Franke and Lindemann, have reported that a decrease in tooth mobility and an improvement in the condition of the periodontal tissues were observable after ten oral baths.

In order to evaluate quantitatively the value of balneotherapy in the treatment of periodontal disease, eight patients with periodontitis or periodontosis were examined after they had received such treatment at St. Moritz, Switzerland, for 14 days (ten treatments). Tooth mobility was measured (Mühlemann's method) before and after each balneotherapeutic procedure.

The results obtained were not encouraging, because slight decreases in tooth mobility are not the most significant factors in periodontal disease,

especially in instances in which such a decrease has been determined immediately after treatment.

In periodontosis especially, the degeneration of the periodontium, causing extreme tooth mobility, may lag behind pathologic changes in the mucous tissue which, sometimes, recuperates more readily than osseous tissue.

Zahnärztliches Institut, University of Zurich, Switzerland

Endocrine and laboratory studies of precocious advanced alveolar atrophy

I. F. Ross, J. Epstein, S. C. Miller and H. S. Kuppermann. *Parodontol.,Zürich* 12:61-65 June 1958

Precocious advanced alveolar atrophy has been described as a specific type of periodontal disease appearing during childhood and continuing during adolescence and adulthood. It is characterized by isolated regions of advanced alveolar bone loss with resultant superimposed inflammatory gingival changes.

Three patterns of alveolar bone loss have been described by Miller: (1) that localized to upper and lower incisors and first molars; (2) that localized to upper and lower cuspids, bicuspids and second molars, and (3) that distributed throughout both dental arches.

Similarity exists between this disease and periodontosis in regard to the unusual distribution, the type and rate of bone loss and the pattern of delayed pocket formation. These symptoms together with the predilection of both diseases for girls and young women would make it appear that these diseases are one and the same disease entity.

Endocrine and laboratory studies of precocious advanced alveolar atrophy in 27 patients (25 women and 2 men) were carried out at the New York University College of Dentistry and the Bellevue Medical Center.

The investigation included the following laboratory determinations: basal metabolic rate, serum cholesterol, serum calcium, serum phosphorus, alkaline phosphatase, oral glucose tolerance, intravenous glucose tolerance and insulin tolerance. In addition to a complete clinical and roentgenographic examination of the teeth, the periodontium and the oral mucosa, the patients underwent a complete physical examination and an endocrine evaluation including tests of urinary 17-ketosteroids and 17-hydrocorticoids as well as serum protein bound iodine.

The results were as follows: the 17-ketosteroid excretion levels were at or slightly below the lower limits of normal, the serum cholesterol levels were at the upper limits of normal, and there was an increase in the carbohydrate tolerance. Specific tests to evaluate adrenal reserve ascertained some adrenal cortical alterations. Further studies with a larger patient material could determine the usefulness of ACTH administration in instances of precocious advanced alveolar atrophy and the consequent determination as to whether adrenal responsiveness is diminished, normal or increased in these patients if compared with normal individuals.

It can be assumed, however, that in precocious advanced alveolar atrophy the generalized bone loss is the result of an inflammation induced by local irritational and dysfunctional factors superimposed on the previously weakened alveolar bone.

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Early tooth splinting in instances of periodontal disease

Carlo Zerosi. *Parodontol.,Zürich* 12:8-14 May 1958 [in French]

In instances of periodontal disease, especially periodontosis, it is necessary to evaluate whether the involved teeth can be preserved, and to estimate the length of time that they may remain in a satisfactory condition after successful periodontal treatment. When this is assessed, the method of treatment can be determined, based on combined clinical and roentgenographic examinations, preferably also a bacteriologic examination of direct smears taken from gingival pockets or sulci.

Early splinting of the involved teeth should be attempted in all instances of periodontosis. The insertion of simple and removable splints, however, often leads to secondary caries and decalcification of the enamel surface. Protection and

preservation of the teeth by means of three-quarter crowns, inlays or jacket crowns combined with permanent immobilization are complicated and often unsuccessful procedures, especially if excellent esthetic results are to be obtained.

In instances of periodontitis early splinting of all involved teeth with self-curing acrylic splints (Obin and Arvins' method, modified by Ceria) is the method of choice at the Dental School of the University of Pavia, Italy.

Immobilization of teeth, obtained with this method, is complete and satisfactory. The advantages of this treatment method in comparison with the methods developed by Mamlock, Koehler, Jeanneret, Weissenfluh, Conod, Singer, and Silvestrini, are as follows: (1) simplicity of technic; (2) superior esthetic result, and (3) lower costs. Occasional loosening of the acrylic splint can be corrected easily and early; extension of the splint, if indicated, is not difficult.

This method, however, can be recommended only for temporary splinting of the anterior upper and lower teeth but not for immobilization of bicuspids and molars.

Periodic check-ups after completion of treatment are important.

Via M. Bandello 4, Milan 1, Italy

A world-wide survey of acute necrotizing ulcerative gingivitis: a preliminary report

Samuel Charles Miller and Henry I. Greene.
J.D.Med. 13:66-82 April 1958

The search for etiologic factors and definitive treatment of acute necrotizing ulcerative gingivitis has been filled with controversy. As yet, a clear-cut concept of the etiology and treatment is not proved.

It was decided to initiate a definitive statistical study, the data of which could become the foundation of basic scientific research in this field. In the first attempt, questionnaires were sent to various dental schools around the world. However, because many of the schools had incomplete records as a result of the war and because each school had a different manner of recording data, information necessary to formulate valid conclusions was not forthcoming.

A new study has been organized. The data are to be collected on a standardized chart which is reproduced. The chart was devised to (1) embrace all the controversial facets involved in etiology and treatment and (2) collect data which might reveal interesting predilections of the disease.

The chart provides for the following information: name of patient, sex, race, age, occupation, degree of severity of the condition, date of onset of the disease, date of dismissal of the patient, evaluation of oral cleanliness, nutritional status of the patient, number of previous instances of the disease, contagion, classification of occlusion, seasonal variations, weather conditions on presentation, method of treatment, any concurrent emotional stress situation, other possible etiologic factors, diagnostic signs, and the name of the clinician in charge of the patient.

A copy of the chart is to be sent to every dental school in the world. The chart has been translated into French, German, Italian, Portuguese and Spanish. It is suggested to have the chart exhibited in that clinic of each dental school where patients with acute necrotizing ulcerative gingivitis appear for diagnosis and treatment. Each year for five years fresh charts will be sent to each school, and the previous year's completed charts will be returned to the authors for preliminary compilation and evaluation of the data. Five years was chosen for the duration of the study so that any statistical irregularities (such as seasonal variations) would be canceled out unless they recurred significantly during the five year period. The study is to begin officially on September 1, 1958, and continue until August 31, 1963.

All the dental schools that have been invited to participate are listed. The bibliography contains 108 references.

[The senior author died February 8, 1958. The address below is that of the junior author.]

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Education

A visit to dental schools in Germany

E. C. Fox. *Brit.D.J.* 105:43-44 July 15, 1958

In the West German Federal Republic there are 17 dental schools with 2,329 dental students and 252 full-time dental teachers; the corresponding figures for Great Britain are 15 dental schools, 2,651 dental students and 201 full-time teachers. The hard work and energy which, apart from other factors, have enabled West Germany to make a remarkable economic recovery are also found in the field of dentistry. National and civic authorities have a helpful attitude toward the dental schools, and private organizations give financial aid.

Extensive rebuilding and modernization programs have been undertaken. Since 1945, two dental schools at Berlin and Münster have been rebuilt completely, and schools at Hamburg and Freiburg are scheduled to be completed in 1958. The other West German dental schools have plans for extensive modernization. The architecture and layout of the new buildings are of magnificent design. All the schools visited had excellent equipment.

The dental curriculum was modified by the (1955) Government Act on Dentistry, designed to raise the status of the profession. No more new *Dentisten* were permitted to practice dentistry after 1955. The German *Dentisten* are about the equivalent of the 1921 dentists of Great Britain. The new dental curriculum is roughly equivalent to the B.D.S. curriculum of a British university.

West Germany is the only European country which has no shortage of dentists. The ratio of dentist to population is 1:1,500. There is no intention of introducing auxiliary personnel. Some German dentists have accepted clinic posts in Sweden.

Dental research in West Germany is encouraged. Most of the schools have research departments equipped with the best modern facilities. A nucleus of experienced research workers is being organized. At the dental colleges of the University of Mainz, the number of experimental rats used for caries research exceeded the number of experimental animals used in all the British dental schools.

In the West German universities everything is done to encourage and help students from other countries; there were 489 such undergraduates in 1956–57. Most of these students came from Norway, the Balkan countries, the Middle East and the Far East.

Each dental school has its own surgical ward, with a minimum of 20 beds, an average of 40 beds, and one school had a ward of 120 beds. A specific feature in all the lecture theaters visited was the demonstration dental chair running on rails, and a mobile dental unit.

University of Birmingham, Birmingham, England

Training in the general field of education for members of dental faculties

Bruce L. Douglas. *New York State D.J.* 24:355-357 Oct. 1958

The following question was sent to the deans of 45 dental schools in the United States: "Do you have a formal program in your school to assist members of your faculty to receive training in the general field of education?" Of 35 deans replying, 25 answered "no" and 10 answered "yes." Twelve of the negative replies were not accompanied by any explanation; the remaining 13 negative replies were accompanied by qualifying remarks indicating that the problem had received varying degrees of recognition. A reading of the comments accompanying both negative and positive replies indicates that it is impossible to separate the answers into purely negative and positive categories. There is obvious interest among the deans of American dental schools in the general field of education, and there is some motivation to equip dental faculty members with knowledge of the field of education.

There is an awareness of the importance of good teaching in U.S. dental schools and of the relationship between schools of dentistry and edu-

cation. More and more dentists are enrolling in courses in teachers' colleges.

Dental schools are parts of universities. As a member of the university family, the dental school should have a voice in the functioning of the larger body. Members of the faculty of a dental school should mix with faculty members of other schools in the same university and share the educational problems which exist in the community. Dental education is not apart from the realm of general education, and dental teaching is not a specialized branch of the field of pedagogy. Dental faculty members should be encouraged to participate in basic courses in schools of education which relate to the efficient functioning of an institution of higher learning.

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Odonto-stomatological education in France

J. Deliberos. *Internat.D.J.* 8:224-225 June 1958

Three factors dominate the training of dentists in France: (1) the evident shortcomings of the government in regard to dental education; (2) the lack of unity in dental training, despite an official syllabus, and (3) the steady progress which dental training nevertheless has made since it was brought under governmental regulation.

Eighty years ago, the practice of dentistry was unrestricted. It was on the initiative of some dental practitioners that the École Dentaire de Paris and the École Odontologique were founded in Paris, and that later the École Dentaire de Lyon was founded in Lyons.

The title of dental surgeon was obtained after a three year course which later was extended to five years. In 1949 a further reform made it necessary for prospective dental students to possess the certificate of the Faculty of Science in physics, chemistry and biology. This reform put the student in dental surgery on an academic footing with the medical student.

All those who obtained the doctorate in medicine have the right to practice, without restriction, in all branches of the healing art. Since this right to practice includes dentistry, some physicians exercised this prerogative. Realizing, however, that some specialization was necessary, they established, some years after the founding of the dental schools, the École de Stomatologie in Paris. This school offers a two year course leading to qualification as a medical stomatologist. Departments of stomatology were established in the various hospitals.

Thus in France there are two classes of dental practitioners: (1) the dental surgeons who have followed a specialized course of training, and (2) the doctors of medicine who have taken a short specialized course after the completion of their medical studies. Today in France there are about 13,500 dental surgeons and 700 medical stomatologists.

Examinations come under the authority of the Faculty of Medicine which confers the dental surgeon's diploma after five examinations taken at the conclusion of each year of study, and the special certificate of the associated Institute of Stomatology given to those physicians who have completed courses there.

Teaching staffs are far from uniform. The curriculum of the French dental schools does not appear too different from that of the dental schools of other countries. In France as in other countries, too little time in dental schools is devoted to the study of histology, pathological anatomy, bacteriology, dental pathology and biochemistry.

There are no postgraduate facilities in France, but each year the two dental schools in Paris organize extension courses which carry the award of a certificate.

Reforms under consideration for some years include the necessity of placing training in the charge of the national government; the creation of autonomous faculties; the institution of a doctorate in dental surgery, and the formation of a more homogeneous full-time and part-time teaching body, released from the necessity of considering purely material contingencies.

Dental School of Paris, Paris, France

Organization

The influence of study clubs in operative dentistry, with some suggestions for organization and management

Lester E. Myers. *J.South.California D.A.* 26:357-360 Oct. 1958

The dental school can teach the future dentist only the fundamentals. A study club affords the best method for continuing dental education. In a study club, ideas are exchanged and correlated through papers, by demonstrations and by doing. The fine manipulative points are taught by capable demonstrators. A properly conducted study club supplies the advanced training of a dentist.

The study club committee of the American Academy of Gold Foil Operators was formed to assist interested dentists to form study clubs on a sound basis. The committee will even help to find a director or demonstrator. A study club is formed of similarly motivated dentists who meet to exchange ideas and to demonstrate technics. Fifty years ago there were few study clubs; today there are many.

The Woodbury Gold Foil Study Club was organized in 1906 and now is in its 52nd year of continuous operation. This club has as officers a president, vice-president, secretary-treasurer, and a director who is elected by the members for a three-year term. It is important that only those who will participate fully be selected for study club membership. Those who join for prestige only and who wish to visit and tell stories will destroy any study club.

The Woodbury Gold Foil Study Club consists of nonoperating guests, operating guests, active and life members. A nonoperating guest may be invited once by any member after consultation with the president or director, and such a guest pays no dues. He may be invited to subsequent meetings only by action of the club membership. This allows the prospective member to decide whether he wants to work with the club, and the club members to decide whether they want him as a member. He remains in this status until there is room, and he may then be invited by the club to be an operating guest.

An operating guest must operate and pay dues until such time as the organization makes him an active member. He must attend and operate in at least six consecutive meetings, and make four gold foil operations acceptable to the director. Then he may become an active member by unanimous vote of the membership.

After becoming an active member, he must attend each meeting and make at least one restoration, unless excused for good and sufficient reason. The dues of the active member are less than those of the operating guest. After being a creditable member for ten years he automatically becomes a life member, which eliminates his requirement of attendance and dues payment. Most life members are still active in the club as demonstrators and operators.

The director makes the assignment of the type of cavity for the operator, and assigns the demonstrator for each operator. The club meets semiannually for a two-day meeting. Several members travel more than 500 miles to the meeting, and one travels 1,400 miles.

A number of study clubs in the Los Angeles area were originated through Guy Baird. Several were organized by Harry True in San Francisco and the Bay Area; Frank Hemphill directs a club in Denver and the Colorado Springs area; Miles Markley directs the Panhandle and the Mile High study clubs. Henry Merchant directs a club in Lincoln, Neb., Wilburn Wilson one in Tulsa, and Ralph Boelsche one in Houston. Alvin Goding directs a small group in the Black Hills and William Higgins one in Albion, Neb. All but two of these directors are or have been members of the Woodbury study club. Such is the expanding influence of a study club.

729 Medical Arts Building, Omaha, Neb.

Therapeutics

Isonicotinylhydrazine in treatment of cervicofacial actinomycosis

L. Nyul. *Zahnärztl.Welt & Reform* 59:384-386 July 25, 1958

Actinomycosis occurs often in animals (mainly cattle, horses and pigs) but seldom in man. The infection in man is caused by either *Actinomycoses bovis*, an anaerobe, or Nocardia, an aerobe. Destruction of osseous tissue may exist for a long time before the symptoms appear. Chronic inflammations involve the maxillofacial region (jaws, tongue and salivary glands) as well as the abdominal, thoracic or mediastinal regions.

Because the clinical picture of actinomycosis shows similarity to that of tuberculosis, the effect of an antituberculotic drug, isonicotinylhydrazine (isoniazid) in the treatment of actinomycosis was tested at the Stomatologic Clinic of the University of Debrecen, Hungary.

The drug has been known since 1912, and is frequently used in treatment of tuberculosis in man. Its chemical formula is $C_6H_7N_3O$. It is colorless, odorless and is slowly affected by exposure to air and light. One gram dissolves in 10 ml. of water or in 50 ml. of alcohol.

Five case reports demonstrate the inhibitory effect of isonicotinylhydrazine against various strains of *A. bovis* causing actinomycosis in the maxillofacial region. No significant toxic effects were observed whether the drug was administered alone (300 mg. daily) or in combination with antibiotics.

Isonicotinylhydrazine, as an inexpensive, effective and nontoxic agent, can be recommended for the treatment of localized and disseminated actinomycosis of the cervicofacial or maxillofacial regions.

Stomatological Clinic of the University of Debrecen, Hungary

Factors influencing clinical evaluation of drugs with special reference to the double-blind technique

Walter Modell and Raymond W. Houde. *J.A.M.A.* 167:2190-2199 Aug. 30, 1958

[Publication of this report was authorized by the American Medical Association's Council on Drugs.]

The fallibility of enthusiastic claims for new drugs makes it desirable to recognize those investigations which are likely to yield substantial data and to lead to interpretations that can be ascribed to pharmacodynamic effects rather than to wish, prejudice, coincidence, accident or error. Of all the devices to insure valid data, none seems to have attracted so much attention as the so-called double-blind technic. Briefly, it is a control device to prevent bias from influencing results. On the one hand, it rules out the effects of the hopes and anxieties of the patient by giving both the drug under investigation and a placebo of identical appearance in such a way that the subject (the first "blind" man) does not know which he is receiving. On the other hand, it also rules out the influence of preconceived hopes of, and unconscious communication by, the investigator by keeping him (the second "blind" man) ignorant of whether he is prescribing a placebo or an active drug. At the same time, the technic provides another control, a means of comparison with the magnitude of placebo effects.

Although the double-blind control is both philosophically and practically sound, there are many studies in which the double-blind technic has been used, wherein the conclusions drawn from the data are open to question.

In addition to the use of the placebo control, the double-blind control should be used whenever and wherever it is feasible. Use of the

double-blind control does not handicap design or reduce sensitivity, but it must be used to deal only with bias and psychic factors which cannot be eliminated. Its use will not validate otherwise poorly designed experiments. When employed in a poorly designed experiment, the double-blind control may prevent a false-positive interpretation, but it also may lead to a false-negative interpretation.

The forces which may influence data in clinical evaluations, especially when subjective responses are involved, include: (1) pharmacodynamic actions; (2) dosage; (3) choice of subject; (4) use of controls; (5) collection of data; (6) sensitivity of the method; (7) placebo actions; (8) bias, and (9) forces extraneous to the experiment.

Each clinical evaluation must be sensitive enough to detect what it proposes to examine, and each experimental design must have built into it an indicator that it is capable of such detection. A negative conclusion is without merit unless a demonstration is incorporated in the clinical evaluation that the method is competent to indicate a positive effect when it is present. In clinical evaluations, another demonstrably effective drug should be used in addition to the placebo control to indicate this essential competence of the method.

The use of a series of graded doses provides a much more substantial basis for drug evaluation than the use of a single dose, no matter how well chosen, since it also serves as a built-in measure of the sensitivity of the method and the discriminating powers of the study population.

The proof and establishment of the effects of many drugs, the proof of the superiority of one drug over another, require a plan which is based not only on the aforementioned principles but which also is designed with due regard to the particular drug, the particular subject, and the particular circumstance under which the experiment must be conducted. There is as yet no standard method; there are only basic requisites, essential controls and some well-established procedures.

Cornell University Medical College, New York, N.Y.

Staphylococcal resistance to antibiotics and its treatment

A. Crone-Münzenbrock and W. Korth. *Chirurg* 28:534-544 May 1958

In order to combat more effectively the increasing resistance of staphylococcal strains to certain antibiotics, it will be necessary to improve and to standardize the present methods of determining sensitivity and resistance of bacteria to antibiotics.

To demonstrate the divergence of results obtained by sensitivity tests to determine staphylococcal reactions to a specific antibiotic, identical specimens were sent to 11 bacteriological laboratories.

The difference in the results received from these laboratories appeared to be due not to the specific test methods used but to the different concentrations of the antibiotic tested. It seems possible that the antibiotic agent proved to be ineffective against the strain of bacteria investigated when, in fact, an insufficient amount of the antibiotic had been used.

For this reason, as well as other considerations, the laboratory reporting sensitivity studies should be more specific. The presently used terms "resistant" and "sensitive" are not adequate for the final evaluation.

Another source of error in determining staphylococcal resistance to antibiotics in general is the state of preservation of the antibiotic. The preparations used in testing may be old and deteriorated. Such errors may have caused the assumed increase in staphylococcal resistance.

Laboratories should use the maximum doses of antibiotics with known efficacy against staphylococci.

Dentists and physicians should exert a greater effort to apply the highest accepted concentration at the actual site of the infection by various local procedures, particularly by the use of topical antibiotics. The continued development of new antibiotics to combat staphylococcal resistance is not sufficient in itself.

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Roentgenology

A study of radiation exposure in the private dental office

Lloyd F. Richards, W. W. Westmoreland, Robert D. England and Wayne W. Loretz.
J.California D.A. & Nevada D. Soc.
34:380-385 Sept.-Oct. 1958

The divisions of dental health and preventive medical services of the California State Department of Public Health conducted a study in 50 private dental offices in Oakland, with the objective of determining the amount of radiation received by the dentist, his employees and the dental patient. In the 50 offices were 52 dentists and 54 x-ray machines of 19 different types and models. Virtually all machines operated at about 65 kv. and 10 ma. The study revealed:

1. External filters were present in 39 per cent of the x-ray units. Beam collimators had been installed in 35 per cent of the machines.

2. Extra-fast film was being used in 38 per cent of the offices.

3. The output rate at the end of the cone varied from 0.28 to above 4.01 r per second. The face dose to the patient ranged from 0.43 to 18.1 r per film. The 18.1 r face dose is 42 times greater than the 0.43 r face dose.

4. The average rate of exposure to the dentist and his assistant from scatter radiation ranged from 1.8 to over 2,000 mr per hour.

5. The amount of stray radiation received by the dentist and his assistant ranged from 0.001 to 17.3 mr per day.

6. The radiation exposure to the dentist and office personnel was below the maximum permissible dose established by the National Committee on Radiation Protection, in all except two offices where the personnel held x-ray films for patients.

7. A wide variation of exposures to the dental patient and office personnel was found which, in many instances, was considered unnecessarily high. Such exposures could be reduced substantially with little or no inconvenience and with minimum expense.

The following recommendations for reducing radiation exposure were made:

1. The fastest film currently available should be used.

2. The recommended amount and kind of filter depend on the rated kilovoltage of the x-ray unit to be used and the dentist's preference of cone length.

3. A beam collimator should be installed. It should be made of lead 1/16 inch thick, with an aperture that will reduce the circle of radiation to a diameter of not more than 3 inches at the cheek of the patient.

4. The dentist and his assistant should stand behind a leaded shield or plaster wall for protection against scatter radiation. If this is not practical, all office personnel should be located as far as possible from the patient during the taking of roentgenograms and should never be in the direct beam of the roentgen ray.

5. In the processing of film, procedures recommended by the manufacturer should be followed precisely.

6. A leaded rubber sheet equivalent to 0.5 mm. of lead should be used to protect the reproductive organs of all patients not beyond the age of reproductive capacity.

7. Office personnel under no circumstances should hold film for patients or touch the tube housing during roentgenographic procedures.

California State Department of Public Health, Berkeley, Calif.

A simple method for the x-ray localization of the upper impacted canine

Hermine Nitsche and Edith Vályi.
Oral. Surg.,Oral Med. & Oral Path.
11:1004-1006 Sept. 1958

A quick, simple, reliable method of roentgenographic localization of impacted maxillary cuspids has been achieved.

A 9 by 12 cm. occlusal film is placed between the upper and lower teeth, not in the middle but nearer to the side being examined. The patient

bites on the film gently. The patient's head is upright, with the nose and mouth in the median plane, so that the film is horizontal. The tube is directed toward the supraorbital foramen on the opposite side, namely, to the root of the nose, at an angle of 55 degrees to the horizontal plane and 10 degrees to the frontal plane. Exposure time is three seconds for 45 kv.

This contralateral alignment produces a distorted but separated picture of the superimposed teeth. The chief advantage of the method is that the buccally impacted cuspid never appears on the lingual side of the teeth, as it may with half-axial projections. One picture gives accurate localization. No meditation or comparison of several pictures is needed.

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Effects of diaphragmatic reduction on gonadal dose in orthodontic roentgen examinations

Leo Taft. *Am.J.Orthodont.* 44:676-686 Sept. 1958

A method is described for reducing by 40 per cent the gonadal dosage resulting from roentgenographic orthodontic examinations.

Fifteen orthodontic patients were exposed to cephalometric, left and right lateral jaw, and ten intraoral roentgenograms. A 1.5 mm. aluminum filter was used on the XRM x-ray machine. The amount of scatter radiation to the gonads was measured by placing in the lap of the patient a Phillip's direct-reading dosimeter. The average dose to the gonads was 24 mr, made up of the following: cephalometric roentgenogram, 0 mr; left and right lateral jaw films, 4 mr, and full series, 20 mr.

Fifteen patients were exposed to the same roentgenographic examination. In this series, a lead radiation protection mask, ⅛ inch thick, with an aperture ⅞ inch in diameter, was fitted into the cone of the head of the machine. The average dose to the gonads was 14.4 mr, made up as follows: cephalometric, 0 mr; left and right lateral jaw films, 3.9 mr, and full series, 10.5 mr. This is a reduction over the dosage in the first series of 9.6 mr, or 40 per cent.

When one compares the 170 r that DeLario (1953) states is necessary to cause temporary sterility with the 14.4 mr average gonadal dosage that a child receives with the use of the lead diaphragm, one notes that the amount of radiation received for orthodontic diagnostic purposes is minute. Nevertheless, all radiation should be reduced, where possible, since its effects are cumulative.

The roentgen rays used for orthodontic examinations are of such great value in diagnosis and treatment planning that it is unrealistic for a parent to deny these diagnostic aids to his child.

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Agfa standardized dental x-ray film

A. Holzapfel. *D.Echo* 28:67-68 Sept. 1958

The new standardized dental x-ray film, recently introduced by the Agfa Company in Leverkusen, Germany, consists of a 125 mm. thick clear safety base—"din safety"—with an emulsion applied to both sides providing a protective layer.

This x-ray film has been tested at several German dental colleges and found especially valuable for roentgen diagnosis of the teeth and defects in the oral cavity.

The relatively thin emulsion carrier appears to be an important prerequisite for the crystal-clear reproduction of contours and provides the film an increased flexibility. The film's base has been deliberately designed clear and colorless, because only in this manner can the strongest contrast effects be obtained.

The film's extremely high sensitivity permits reducing the time of exposure to a minimum. In spite of this increase in sensitivity, the film has a fine grain which allows the tracing of the minutest structural detail. A metal foil inserted on one side of the film absorbs diffused roentgen rays, thereby maintaining the absolute clearness in reproductions. Each film is provided with a notch which can be traced in the darkroom. Sufficient space for wording is provided by a label near the Agfa trademark.

The plastic foil of the folding case offers full protection against the penetration of saliva and renders the film package completely impenetrable by light.

Rounded corners prevent cutting into the soft oral tissues, thereby avoiding nausea. The film, having been made hygienic, can be placed in the patient's mouth without hesitation.

In the darkroom, the films can be removed from the package in a simple manipulation. The Agfa standardized dental x-ray film is available in packages containing 25 single or double films, 2 by 3, 3 by 4, and 4 by 5 cm. Larger packages containing 150 single or double films, however, are available only in the size of 3 by 4.

A specially designed Agfa dental film box serves as a safe and practical storage for the dental films near the x-ray apparatus for immediate use, as well as for the storing of the already exposed films until processing in the darkroom.

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Life-shortening by whole- and partial-body x-irradiation in mice

Robert F. Kallman and Henry I. Kohn. *Science* 128:301-302 Aug. 8, 1958

The fact that ionizing radiations, in whole-body doses which cause little or no immediate morbidity, shorten the life span of animals has been demonstrated in many experiments. With such evidence as a background, it has been argued that partial-body exposure, in man as well as in experimental animals, would have a life-shortening effect in strict proportion to exposure dose or integral dose.

The present data, taken from an experiment designed for another purpose, illustrate the different potencies of partial-body and whole-body x-ray exposure in shortening the life of the mouse.

Groups of mice received partial-body irradiation, three different fields being used—bilateral thorax, right hemithorax, and pelvis. Other groups of mice received whole-body exposure to doses ranging from 300 to 1,200 r. Partial-body doses ranged from 600 to 1,800 r.

Whole-body exposures of 300 r and 560 r both shortened life significantly and to about the same extent. In consequence, the decrement in life span per 100 r is greater at the lower dose.

Per unit of tissue dose, partial-body exposure to the pelvis or chest, or to both, was much less effective than whole-body exposure, especially after 300 to 750 r.

In the whole-body experiments, the smallest dose was more effective per unit dose than the larger ones. The smaller partial-body exposures, however, were less effective per unit dose than the larger ones. Extrapolation of the data for partial-body exposure suggests that, at still lower doses—for example, 100 r—the effectiveness per unit dose may be so reduced as to be negligible

The present data indicate how varied the life-shortening effects of partial-body and whole-body exposure can be, and the difficulties in attempting to extrapolate from one to the other.

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Radiation doses from diagnostic roentgen rays

B. Walthard. *Fortschr.Röntgenstr.Nuklearmed.* 82:145-159 June 1958

Staff members of the Institute of Pathology of the University of Bern, Switzerland, were exposed experimentally to the radiation from both radioactive materials and roentgen rays of conventional diagnostic x-ray equipment.

In order to assure that the total body irradiation did not exceed 0.3 r per week, an investigation of the roentgen ray output of various diagnostic x-ray machines, used in dental and medical practice, was made prior to the experiment.

A phantom apparatus and a Victoreen condenser skiameter, modified for soft roentgen rays, were used to determine the total and individual dosage rates. According to F. Day's method, the data were tabulated in two graphs which were used to determine the exposure to roentgen rays during routine diagnostic dental and medical examinations.

Knowledge of the dose at every point is the basis for any rational scheme of roentgen ray diagnosis and roentgenotherapy. The actual dose at the desired point can be found by taking the percentage of the axis dose given in the graphs. It is, thereby, possible to calculate with reasonable accuracy the dosage received by any part of the radiation field.

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Odontoblast nuclei in dentinal tubules exposed to suction

Martin Brännström. *Svensk tandläk.Tskr.* 51:171-173 April 1958

The aspiration of odontoblastic nuclei into the dentinal tubules and its relation to pain have not yet been completely explained. The author has begun a series of experiments to examine these phenomena beneath prepared cavities.

Suction was applied to the cavities for from two to three minutes. It was noted that this caused pain. The teeth were extracted after intervals of from 5 to 20 minutes. Histologic study of the extracted teeth revealed numerous odontoblastic nuclei in the dentinal tubules.

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Tissue changes in the dental pulp: an experimental histologic study

Kaare Langeland. *Odont.Tskr.* 65:249-286 Aug. 1957 [in English]

The knowledge of tissue changes in the pulp is an important aspect of restorative dentistry. The present study began as an investigation of pulp reactions to a series of filling materials, the material comprising more than 400 cases. It soon became evident, however, that many of the criteria used in the evaluation of pulp reactions were not valid. Many of the earlier histologic findings judged to be indications of pathologic reactions were found also in sections from clinically intact teeth, used as controls. A histologic picture of a "normal" pulp was established, and standardized methods of investigation were worked out. The following conclusions were reached:

1. In an investigation of dental pulp reactions to exogenous influences it is necessary to compare the histologic sections from the experimental material with sections from clinically intact teeth of the same age group, the latter serving as a control.

2. The laboratory technic must be identical for all the specimens to be compared.

3. A series of phenomena, often used as criteria of a pulp response, have been observed in clinically intact teeth. Consequently, such findings cannot unconditionally be taken as criteria in the experimental material. The phenomena in question are: eosinophilic zones, vacuoles, reticular atrophy, fatty degeneration, vacuoles and other deviations from the normal in the odontoblasts, erythrocytes and cell nuclei in the dentinal tubules, capillaries in the odontoblast layer, and erythrocytes scattered over the sections as well as calcifications.

4. The appearance of a brown pigment in connection with pathologically changed vessels or extravasated erythrocytes is a criterion of stasis or hemorrhage.

5. Inflammatory cells may appear in the pulp of clinically intact teeth, and probably are caused by undetected carious attacks. Experimental cavities therefore should be placed in intact regions of the teeth, if the purpose is to evaluate the effect of a filling material on the pulp structure. After fillings have been inserted in carious regions, the reaction observed in the subjacent pulp tissue must be regarded as the result of both caries and the filling material, provided that the filling material gives perceptible pulp reactions when inserted into intact regions.

6. For the same reason, teeth of older individuals are not suitable for investigations of this kind, because they may have been exposed to caries or attrition.

7. Removal of the enamel and exposure of the dentin cause a pronounced reaction in pulp tissue. Thus, defective fillings may, in addition to the reaction created by the filling material, cause reactions similar to those observed in the pulp tissue subjacent to open cavities.

8. Dentin exposed by preparation of cavities or abutments should be covered immediately with a nonirritant material which does not permit leakage.

9. Migration of odontoblast nuclei into the dentinal tubules must be considered the initial pulp reaction to injury of the dental structures. No odontoblast nuclei were observed in the dentinal tubules after an observation period exceeding three weeks.

10. After migration of their nuclei into the dentinal tubules, the odontoblasts deteriorate and cause an acute inflammatory reaction in the pulp tissue subjacent to the cavity, similar to that observed as a result of deterioration of tissues elsewhere in the body. Regeneration or replacement of the migrated odontoblasts has not been observed. This is the reason why the irritation dentin contains fewer dentinal tubules and has an irregular structure.

11. In experimental investigations on pulp reactions two stages should be distinguished: (1) reactions to cavity preparation: for the proper evaluation of these, the teeth should be extracted within a short time, in the same sitting; (2) reactions to the filling material: these can be evaluated only after an observation period of at least one month.

12. Foreign body giant cells are formed in the pulp after the insertion of sterile talc. Five to 21 days are required for their formation.

13. Mitosis occurs frequently in the pulp tissue in inflammation regions, but was not observed among odontoblasts. Thus, cell division may take place in the dental pulp, as in connective tissue elsewhere in the body.

14. Carious dentin deposited in experimentally prepared cavities did not produce dentin caries after observation periods of up to 84 days. Such a deposition caused an inflammatory reaction in the pulp tissue. When a severe reaction had been produced in the pulp, no irritation dentin was formed; when milder reactions were produced, an irregular irritation dentin was observed.

15. The loosely formed irritation dentin cannot be regarded as a protection against further injury of the pulp tissue. The whole dentin region between the cavity bottom and the pulp seems to be permeable even in the presence of irritation dentin.

16. No definite regeneration of injured structures could be detected in the present material. Signs of repair were observed in the pulp tissue. The acute reaction in the injured pulp tissue may subside and leave a more or less extended scar tissue. It also may pass into a chronic stage of inflammation or a necrosis.

17. Operative procedures and filling materials which produce a severe acute reaction in experiments should be deemed unsuitable. It is the sum total of the injuries caused to a tooth which may jeopardize the vitality of the pulp.

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Artifacts in mast cell metachromasia produced by hyaluronidase preparations

Alvin L. Morris and George A. Krikos.
Proc.Soc.Exper.Biol.& Med. 97:527-529
March 1958

In the course of recent experiments it was observed that, under specific conditions of staining with toluidine blue, mast cells of the hamster were rendered nonmetachromatic by previous treatment with commercially available hyaluronidase preparations. Commercial hyaluronidase preparations appear to contain substances which are capable of preventing metachromatic staining of mast cells of pH 2 and pH 3, thus simulating enzymatic hydrolysis of stainable mucopolysaccharides.

Through a series of investigations it was possible to show that the observed effect was not the result of hyaluronidase activity but was instead an artifact.

The evidence suggests that staining is prevented by substances, perhaps proteins, which form a complex with mast cell mucopolysaccharides and prevent staining. It is possible that hyaluronidase itself may be one of the masking proteins.

The value of an inactivated enzyme control and the use of salt solutions of hyaluronidase in histochemical studies are emphasized.

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Anatomy

Mandibular adjustment to functional tooth attrition

T. Murphy. *Australian D.J.* 3:171-178 June 1958

The question asked in 1924 by Thomson—"If no tooth loss occurs, what changes take place at the angle of the mandible with increasing years?"—still lacks an answer based on observation and measurement of biological material. Bones from present-day civilized man hardly merit consideration because no foodstuffs with abrasive properties are offered to the grinding surfaces of the teeth; the slight masticatory effort presents few functional stresses to cause changes in the mandible.

In a study on postmaturity changes in mandibular form, 476 mandibles from adult Australian aborigines were examined. Of the 476 mandibles, 220 were classified as female, with moderate tooth attrition in 96 and advanced attrition in 124; and 256 mandibles were classified as male, with moderate tooth attrition in 106, advanced in 150. Fifteen measurements of the profile aspect of each bone, as described by the author (1957), were recorded.

It was concluded that the postmaturity condylar changes are largely additions to the posterior end of the main core of the mandible. A forward shift of the rest of the main core relative to the upper jaw must follow. This carries the mandibular arch forward in relation to the maxillary arch. These changes form a link between tooth attrition and the development of an edge-to-edge incisor bite, and provide a mechanical explanation of the functional hypothesis.

The sequence of events appears to be as follows:

Functional tooth attrition is compensated by continual vertical eruption of the teeth. When this is outpaced by attritional tooth loss, intermaxillary space in the grinding phase of chewing movements is reduced. This alters two skeletal relationships, at the temporomandibular joints and at the reciprocal upper and lower arches. These alterations are adjusted by changes in mandibular form. At the joint, the adjustment is made by stimulation of condylar growth, made possible by the retention into adult life of the growth potential of the condylar cartilage. This also is a factor in widening the mandibular angle.

At the reciprocal tooth arches, widening of the mandibular angle restores to some extent the lost parallelism. Some ill-understood endogenous factor controls the general proportions of the bone, so that angular widening is accompanied by reduction in ramus width, deepening of the mandibular notch, and consequent sharpening of the coronoid process.

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Morphology and morphogenesis of human teeth

S. Taviani. *Internat.D.J.* 8:157 June 1958

Two theories—that of Cope-Osborn and others and that of Bolk—have dominated the interpretation of the morphological genesis of human teeth. Neither theory recognizes the perfect equivalence existing between the cuspal and radicular apparatus of human teeth.

Both theories assert that human teeth consist of aggregates of cusps and elementary roots, so that in a tooth with four cusps and three roots only one radicular element would correspond to two cuspal elements. It is impossible to harmonize such assertions with the mechanism of the dental organogenesis, in which the development of the cusp is connected inevitably to that of the root. Briefly, every cusp must have its own root and each root its own cusp.

It can be proved that human teeth do not consist only of cusps and of elementary roots, but of various contributing factors; cusps and roots each contain two or three elemental entities. In

other words, the cusps and the roots of human teeth are the product of a union of two or more dental elements.

Therefore, if a cusp has two roots, or if one root has two cusps, it means that in the specific cusp or root, two components are involved; in other words, components relative to each one of the two elemental counterparts.

This also explains the appearance of cusps and roots in an excessive number which, in itself, does not imply that neoformative changes occurred, but that human teeth have a tendency to reconstruct their prototype by the union of six dental elements.

University of Cagliari, Sardinia, Italy

Studies in facial growth: the mandibular ramus and the teeth

James H. Scott. *D.Practitioner* 8:327-328 June 1958

Although most textbooks on dental anatomy state that room is provided for the permanent molars by resorption at the anterior border of the mandibular ramus, this statement is false.

The posterior end of the alveolar process, in which the molars develop, lies on the inner side of the ramus. The anterior border of the ramus lies to the outer side of the erupting tooth and is not involved in the process of eruption. It is unnecessary for the ramus to be resorbed to "uncover" the erupting molar.

The anterior tendinous part of the temporal muscle is attached to the anterior ramal margin down to its junction with the body of the bone. As the mandible is thrust forward by growth at its condylar cartilages, the insertion of the temporal muscle would be carried beyond the limits of the temporal fossa, unless there was at the same time a continual cutting back of the ramus in front so as to maintain the proper position of the anterior edge of the muscle as the mandible moves forward relative to the skull. The mandible, moreover, is thrust downward as well as forward and the alveolar bone ascends by surface deposition beneath the gingiva so as to maintain the teeth in occlusion. As a result, the junction of the body with the ramus ascends. While these bony changes are taking place, the lower attachment of the temporal tendon is freed from the bone so that the muscle gradually ascends along the anterior edge of the ramus.

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Endodontics

Tweezers for holding and introducing root canal instruments

Heinz Ziebe. *D.Echo* 28:67-68 Aug. 1958

In root canal treatment the instruments frequently are held and introduced by the dentist's fingers. Such a procedure obstructs the view and makes surveying of the operative field difficult. This is especially true in root canal treatment of molars. These old-fashioned technics are inefficient because they are often accompanied by considerable fumbling before the instrument can be inserted into the root canal.

Occasionally, to improve visibility, dentists use simple cotton tweezers for holding and inserting root canal instruments, but too often the instruments slip away or snap out of such tweezers.

Dressing or thumb forceps are more convenient but still they are not able to hold the small root canal instruments firmly enough to be inserted satisfactorily.

The author has designed a pair of tweezers which can be used to hold and insert root canal instruments and yet provide a full view of the tooth to be treated.

At the head of the tweezers are two grooves permitting a firm grip for all root canal and nerve instruments. These grooves run in different directions (vertical, angled backward and angled forward) thereby eliminating turning and twisting. The tweezers can be opened and withdrawn easily if the inserted root canal instrument requires further manipulation with fingers.

The stainless steel tweezers, already approved by many German dentists, are an addition to dental instrumentation.

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Biochemistry

The distribution of alkaline phosphatase in normal and transplanted rodent teeth

Shirley Glasstone. *Brit.D.J.* 105:58-62 July 15, 1958

The distribution of alkaline phosphatase was studied in normal tooth germs of the rat, mouse and hamster, and under experimental conditions.

Alkaline phosphatase is found in the cells of the external enamel epithelium, the stellate reticulum, the dental papilla and the odontoblasts. In the ameloblasts, alkaline phosphatase is seen only in the basal region of the cells while they are functional but becomes distributed throughout the cytoplasm of these cells when they become shortened after enamel is formed. Alkaline phosphatase is distributed throughout the cytoplasm of the cells of the internal enamel epithelium at the tip of the tooth in incisors and at the base of the crown near the epithelial sheath of Hertwig in molars, after dentin is formed.

The enzyme alkaline phosphatase appears to be associated with cell metabolism and the deposition of enamel and dentin matrix rather than with the process of calcification.

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Biologic synthesis of human teeth

Guido Fischer. *Schweiz.Mschr.Zahnhk.* 68:279-301 April 1958

In its initial stage of development, the human tooth germ is but a fraction of the developing organism and its proper growth depends mainly on the health of the expectant mother.

The development of human tooth germs, whether normal or abnormal, reflects the general health, the nutritional condition and the psyche of the mother.

Although hereditary factors may transmit certain characteristics, the mother's health is the decisive factor in the development of all embryonal organs, in the creating of resistance to disease and in predisposing conditions leading to dental caries and periodontal disease.

Although the role of the hard tooth substances as conductors of body fluids has been recently recognized, the fact that there exists a continued interchange of substances between the pulp and the saliva has given the problem of dental disease a new aspect.

The biology of the human tooth system has become the primary factor of dental research in the design and development of new treatment methods because the entity of body and mind and the general metabolism have entered the picture.

The intensive studies of human and animal saliva have revealed a variety of properties inherent to saliva and their influence on dental health.

Berg bei Starnberg, Oberbayern, Germany

Effect of certain amino acids and peptides on hyaluronidase production by Staphylococcus aureus

Stephan E. Mergenhagen. *Proc.Soc. Exper.Biol.& Med.* 97:703-706 March 1958

Although *Staphylococcus pyogenes* var. *aureus* has been cultivated in chemically defined media, the synthesis of hyaluronidase in a completely synthetic medium has not been described.

The strain of *Staph. pyogenes* var. *aureus* designated as SAB2 synthesized hyaluronidase in a chemically defined medium only in the presence of tyrosine and tryptophan, even though these amino acids were not required for optimal growth. Glycine was indispensable for growth of this organism. Supplementation of the synthetic medium with glycyl-L-tyrosine or glycyl-L-tryptophan increased both growth and hyaluronidase production. This may indicate that the peptides accelerated growth and enzyme production by supplying the essential amino acids in a more usable form.

University of Rochester School of Medicine and Dentistry, Rochester, N.Y.

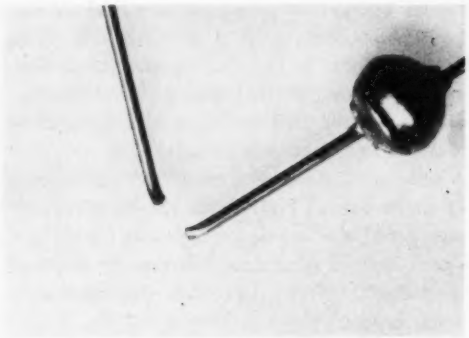


Figure 1 Simple form of localizer. The point is sharp and has a bevel like a needle

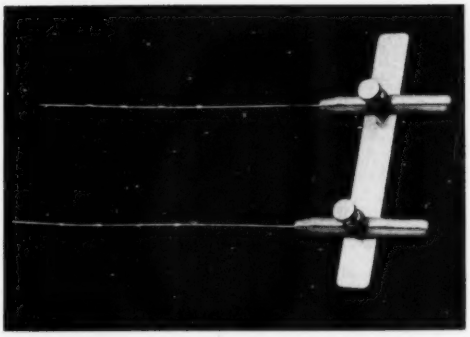


Figure 2 Two large localizers on an adjustable crossbar

General

Recovery of broken needles

W. Fraser-Moodie. *Brit.D.J.* 105:79-85 Aug. 5, 1958

An investigation of broken needles in the oral cavities of 26 referred patients in a large general hospital led to the conclusion that the commonest cause of needle breakage is the use of an old needle, or a needle which had been bent and then straightened again. No needle should be used more than six times. A bent needle should be discarded.

The needle never should be buried up to the hub. A short needle never should be used for a mandibular block. At least ¼ inch should be unburied at the maximum depth of injection. The bevel of the needle should be towards the bone. If the point is felt to strike bone or a tough, resistant structure, the needle should be withdrawn a small amount before proceeding with the injection.

Interrogations have confirmed that deviation of the long axis of the needle from the long axis of the syringe during a block injection has been a cause of breakage. The syringe should be kept absolutely steady, and be adequately supported. It should not be possible for the syringe to sway unexpectedly with the needle firmly embedded in the tissues. In two instances it was stated that the needle snapped while the grip on the syringe was being altered. The soft tissue of the site of injection must be controlled with the forefinger of the left hand.

The dentist, when giving an inferior dental injection, should visualize the pathway taken by the needle and mentally enumerate the exact anatomic relations.

In a number of instances, some sudden, unexpected movement of the patient is the cause of the breakage. Patients should be carefully assessed and managed.

Once the needle is broken, the fragment or fragments must be removed at the earliest opportunity. Although in some regions, such as the buccal aspects of the jaws, the fragments may remain *in situ* for years, their movements cannot be predicted with any degree of certainty. The rapidity and the extent of movement of some needle fragments, especially those on the lingual aspect of the mandible, are remarkable. The continuous movement of fragments may produce cicatrization; this scarring in turn produces trismus, discomfort, dysphagia and referred pain. A late sequel may be hemorrhage when a vessel is penetrated.

If a portion of the broken needle is left protruding from the soft tissue, it should be grasped at once. The position of the left forefinger in the retromolar fossa should not be altered and the eye

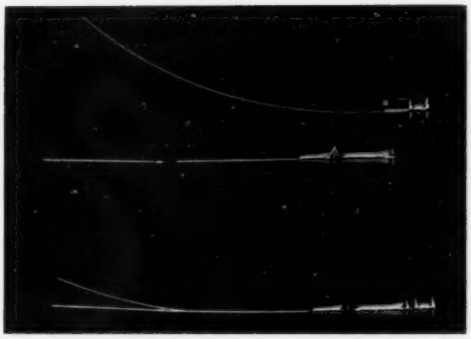


Figure 3 Single needle with sharp stylet used as localizer

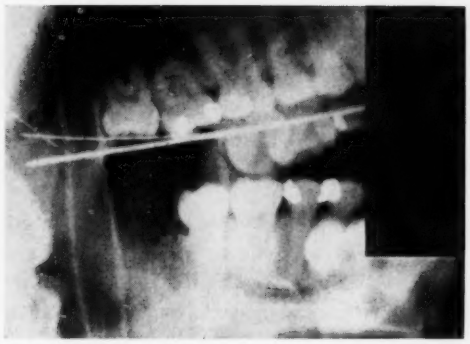


Figure 4 Roentgenogram showing broken needle in the fork between the needle and its stylet

must be kept on the tiny target. The operator has only about five to seven seconds to grasp the end of the broken needle before it vanishes into the tissues. Small, curved mosquito forceps perhaps are the best forceps with which to grasp the needle; tweezers usually are the only instruments available for use in this emergency. Once grasped, the fragment should be removed along the same line as that occupied by the syringe during the injection.

If the needle is missed, a short incision is made over the site of the puncture under local anesthesia, and an attempt is made to locate and grasp the fragment. Delicate instrumentation and the use of the aspirator are imperative. During even the most gentle swabbing, there is the danger of pushing the needle deeper into the tissues. Success at this stage is difficult. After a few minutes of fruitless search, the task should be abandoned and the incision closed by suture. The patient then should be treated by an experienced operator at a fully equipped center, preferably within 48 hours and after any inflammatory reaction with swelling is controlled.

Intraoral and extraoral roentgenograms in different planes are taken. Having ascertained the position occupied by the fragment, the operator must decide on the technical details of the operation, the best method of locating the fragment, the type of anesthetic most suited to the patient, the fitness of the patient for surgery and the antibiotic cover. Endotracheal anesthesia is indicated in practically every instance. To carry out an exploratory operation without the assistance of pilot needles, accurate localizers, or an electric or electronic locator, is to invite failure and cause unnecessary trauma.

A simple form of localizer (Fig. 1) consists of a fine rod with a number of small prominences which act as guides in relating the localizer to the fragment. Two large localizers may be fixed to an adjustable crossbar (Fig. 2). Another locating technic utilizes a single needle with a stylet emerging from the side about 1½ inches from the point (Fig. 3). After a little practice, it is possible to get the fragment in the V of this localizer (Fig. 4) at the first attempt. With the position of the fragment fixed in relation to the localizer, the surgeon is prepared to dissect down to the fragment. A thorough knowledge of the anatomic structures and their relations is essential. A forehead light, a dark theater, an aspirator and a competent assistant make the operation less arduous. Hill's raspatory and Moon's dissector are valuable instruments when work is being done in this region. The use of an electric locator has been of value on a few occasions. An even more powerful instrument is the Berman-Moorhead locator for the detection of metallic foreign bodies in the tissues.

Postoperative complications on the whole have been comparatively insignificant. Those patients seen within 48 hours have responded with minimal trismus and swelling.

Central Middlesex Hospital, Park Royal, London, N.W. 10, England

Antigenicity of cotton layers in sterilizers

J.A.M.A. 167:2260 Aug. 30, 1958

Q. For some reason, there is a layer of cotton under a perforated porcelain plate on the bottom of a small sterilizer. The boiling water which sterilizes instruments, especially syringes, obviously comes in contact with the cotton. Since cottonseed oil has highly antigenic properties, could any extract of the cotton enter the syringes, and would this give rise to allergic reactions in patients?

A. Present evidence indicates that during the process of manufacture cotton is subject to so many different chemical processes that it is rendered nonantigenic. There appears to be no danger of contaminating syringes even if they are boiled in a medium which contains cotton. Otherwise, it would be difficult to understand why cotton is used in a sterilizer when some other materials, such as rubber, are available which have no antigenic properties.

535 North Dearborn Street, Chicago 10, Ill.

The public looks at dental care

Eliot Freidson and Jacob J. Feldman. *J.A.D.A.* 57:325-335 Sept. 1958

How does the public view the dentist? Are people satisfied with the dental care they get? How well informed are they about the value of regular visits to the dentist? What prevents the public from utilizing dental care more extensively? Tentative answers to these questions were obtained from a national survey made in 1955 by the National Opinion Research Center of the University of Chicago, financed by a grant from the Health Information Foundation.

The survey shows that the prestige of the dentist in the United States is high; the public rated the general standing of the dentist above that of the pharmacist, hospital nurse, lawyer and public school teacher and below that only of the physician.

Almost everyone who saw a dentist during the past year was satisfied with the care and treatment he received; 89 per cent of those responding reported themselves "entirely satisfied."

Thirty-two per cent of the public felt there were not enough dentists. Dentists' fees were considered "much too high" by more of the public than were physicians' fees, although dentists' fees were criticized by fewer people than were the cost of drugs and of hospital services. When the public was asked about the cost of food, clothing and repairs, as well as of health care, health care turned out to be least criticized of all. Only 17 per cent of the population failed to criticize the cost of food, and only 18 per cent had no criticism of repair charges.

Thirty-two per cent of the public reported that neither they nor any other member of their family had been to a dentist during the year preceding the interview. A major problem in the improvement of dental health is why so many Americans have not seen their dentists within the period of a year.

Although 88 per cent agreed that "a person should make a practice of seeing the dentist regularly, every six months or a year, even when his teeth are all right," there is a discrepancy between what the public knows to be good practice and what it does. Husbands see the dentist on a regular basis less than do wives, and adult members of families tend to see a dentist regularly less often than at least one of their children. Thirty-four per cent of the adult population felt that they or their spouse or children "should have had more dental care than they did during the past year."

An education campaign will not by itself bring about maximal utilization of dental services, for there is a considerable discrepancy between knowledge and practice. This discrepancy varies from one segment of the population to another, and the major principle of its variation seems to be one of economic differences. Some people lack the means necessary to put their knowledge into practice.

When the public was asked if comprehensive dental insurance seemed attractive, 40 per cent answered that it was a good idea, and 55 per cent felt they would be just as well off without it.

Fear of the dentist and of pain anticipated in dental care may be another factor preventing wider use of dental services.

The use or avoidance of dental services is a complex product of the education involved in self-

diagnosis, of the income level involved in weighing costs, of the dental health and past dental experience involved in anticipating pain, and of the social experience involved in assessing inconvenience.

City College of New York, New York, N.Y.

Multilingual reporting of scientific data

Josef Brozek. *Science* 127:764-765 April 4, 1958

The typical scientist cannot aspire to be a polyglot. He has to rely on his helpers—the writers of abstracts and reviews. The usefulness of a scientific paper, written in a language understandable only to a limited audience, is increased by the attachment of a synopsis in one or more world languages.

Another important step that the author (and the publisher) can take in the interest of making a scientific communication more widely intelligible is the presentation of legends, table headings and graph labels in a language of world-wide currency.

In sciences which operate with quantitative data, the tables and graphs contain, as a rule, the essential new information. The presentation of tabular and graphic material in a form intelligible to the majority of scientists will go a long way toward removing the curse of nationalism and provincialism in scientific publications. In works which rely heavily on pictorial documentation, the use of bilingual legends may be both preferable on scientific grounds and more economical in the long run.

University of Minnesota, Minneapolis, Minn.

The microhardness of enamel and dentin

R. G. Craig and F. A. Peyton. *J.D.Res.* 37:661-668 Aug. 1958

This study was undertaken in an attempt to establish any difference in hardness between one region of a tooth and another or between different types of teeth.

The Knoop hardness numbers were determined for enamel and dentin on sections of human, mature, freshly extracted, noncarious teeth. For all teeth, the over-all average hardness value for enamel was 343 $\pm$ 23, and for dentin was 68 $\pm$ 3.

About 15 per cent of the hardness values obtained on both enamel and dentin had such large deviations from the average that they must be considered to be outside the range of experimental error and represent regions having exceptionally high or low hardness.

No definite trend in the hardness of enamel from the dentinoenamel junction to the outer surface, or from the crown to the cervical margin, was detected. Likewise, no trend in hardness in the dentin from one section of a tooth to another was observed.

The greatest variation in the hardness of enamel was found just below the occlusal surface, although the average value for this type of section was not significantly different from the average values for other sections.

School of Dentistry, University of Michigan, Ann Arbor, Mich.

Did you ever see a dream working?

Anna L. Hyer. *Audiovisual Instruct.* 3:128-129 April 1958

In February 1958, the Council on Documentation Research called a special meeting to discuss the growing need for the creation of a national center for processing science information.

The Soviet Union already has taken steps to solve the problem of making available existing knowledge on original research carried out nationally and internationally. In 1952, the U.S.S.R. established an All-Union Institute for Scientific and Technical Information. This institute has a full-time staff of over 2,300. It publishes about 400,000 abstracts from more than 800 foreign journals.

Of the 200 Russian journals of major importance to American researchers, only 30 are being translated under U.S. government sponsorship.

No mention of the educational requirements was made at the February meeting of the council, but American scientists can dream of a national center coding information pertinent to education, science and research of various fields. This national center should prepare abstracts for distribution and conduct machine searches for answers

to specific questions. Education might then be able to cut by ten years the lag between research and practice. In all likelihood new relations between the different scientific fields would develop, research would improve and new experimental patterns or problems might emerge.

Time and money could be saved in the preparation of bibliographies, references or catalogues if film utilization of foreign research data would be increased. A national service could be envisioned supplying coded cards to duplicate information available in national and international libraries, and to specialize in searching services for dental, medical and other scientific research. Under such a program each specialized research center would have a uniform type of searching equipment.

Today, American research would be willing to settle for a semiautomatic method of motion picture searching if a lengthy bibliography has to be prepared.

1201 Sixteenth St., N. W., Washington 6, D.C.

Effects of saccharides on tooth substances

V. Dostál. *Českoslov.stomat.* 58:80-86 March-May 1958

The effect of disaccharides (sucrose, maltose, lactose, cane and beet sugar) and of monosaccharides (grape, potato and starch sugar) on human tooth structures was studied at the Dental Institute of the University of Olmouc, Czechoslovakia.

In these studies, the chemical formula of the saccharides, the mechanism and the time of consumption and the amount of carbohydrate contents of the normal diet were considered.

It was established that bee honey, which contains dextrose and levulose, is very nutritious for human beings. Consumed in excess, however, it exerts an unfavorable effect on enamel and dentin. Several experiments with different animal species were carried out to determine the pH values of Czechoslovakian honey before and immediately after consumption (dextrose and levulose contents of the saliva). The pH level varied from 6.7 to 7.2. The dilution of honey by water and human saliva and the relation between the pH value and the amount of saliva secreted during mastication were studied in vivo and in vitro.

It was established that honey diluted by water or human saliva decomposes powdered enamel of permanent teeth within a few hours, much faster and more intensively than concentrated disaccharides or monosaccharides.

Invertin (invertase or saccharase), the enzyme which is mainly responsible for the hydrolysis of sucrose to dextrose and levulose, splits beet and cane sugar which are more nutrient but also more cariogenic than honey, thereby promoting the development of initial caries.

Tylova 3, Olmouc, Czechoslovakia

Baptist dental health program in Nigeria

Baylor D.J. 8:14-16 Spring 1958

Howard McCamey, a graduate of the Baylor University College of Dentistry, in 1940 became the first dental missionary to enter the mission field. He and his wife, a graduate of Baylor Nursing School, were sent by the Southern Baptist Convention to establish a dental clinic in connection with the Baptist Hospital at Ogbomosho, Nigeria, West Africa. Since there was then no electricity in Ogbomosho, Dr. McCamey used a foot engine, a foot-powered lathe and a flashlight.

To people accustomed to extractions by the blacksmith, the impact of dentistry with anesthesia was dramatic. On his first trip into the interior, Dr. McCamey received a message from the village chief who was in pain with an abscessed molar. Dr. McCamey was taken to the throne room where he examined the chief and gave him medication. When the procaine hydrochloride took effect, the chief thought that he had been cured. Dr. McCamey explained that the removal of the tooth still would be necessary, and the chief was amazed at the painless extraction. The next morning, before Dr. McCamey arose, the people of the village were standing in a line outside the church, waiting for dental treatment.

It is the custom of the Nigerian people to pay for everything; if given something without cost, they have no respect for it. Consequently, a small charge is made for dental service.

In 1952 an additional dentist, Wayne Logan, also a Baylor graduate, assumed a post in Ogbomosho. In 1954 the Baptist headquarters was

moved to a new building in Ibadan, and Dr. McCamey and Dr. Logan moved into a modern, two-chair dental clinic, complete with laboratory. Plans are being made for an additional dental clinic in Eastern Nigeria and for two more dental missionaries.

The laboratory technician in Ibadan is a Nigerian boy trained by Dr. McCamey; the boy's greatest wish is to study dentistry in the United States. Nigerian boys serve as assistants and Nigerian girls are used as receptionists and clerical workers.

With the modern dental clinic in operation in Ibadan, Dr. McCamey devotes much of his time to oral hygiene education. He lectures to students in teachers' colleges, nursing schools and seminaries.

Baylor University College of Dentistry, Dallas, Texas

Masticatory performance of intact and mutilated dentitions

A. A. D. Derksen, W. van Haeringen and J. B. Visser. *Tschr.tandheelk.* 65:381-426 June 1958

Uncomplicated but reliable methods for measuring the masticatory function would be desirable aids in the determination of masticatory performance and efficiency of both the natural dentition and artificial dentures.

A preliminary investigation to determine the masticatory performance of intact and mutilated natural dentitions in six test subjects was carried out at the department of prosthetic dentistry of the Dental Institute of the University of Utrecht, The Netherlands.

A synthetic test food, Baker's "Perfectocoll," was selected, and its suitability for sieve analysis was investigated. Each subject was required to chew eight cubes of this food preparation during each of four tests.

The degree of fractionization of the chewed food was established after completion of each test with the aid of 11 sieves with round orifices and decreasing diameters (according to the Dutch classification for sieves: 9.8, 8.0, 6.8, 5.6, 4.8, 4.0, 3.4, 2.8, 2.0, 1.0 and 0.5 mm.). The amount of food particles which passed through each sieve was added to the amount passing through the next sieve. The total quantity of food masticated by each test subject was calculated by subtracting the combined weight of the 11 fractions from the weight of the initial food quantity. This also gave a basis for the calculation of the number of masticatory movements required by each person to produce a standard degree of pulverization of Perfectocoll.

The average masticatory performance of the three subjects with an intact dentition was about 88 per cent; that of the other three subjects with a mutilated dentition, 78 per cent. As the masticatory function and the sieving procedure proceded, the selective process became more evident because the larger foods particles disappeared more rapidly than experienced in random grinding.

The initial object of the preliminary investigation was to find a basic test method not only to be used for determination of masticatory performance and efficiency of persons with a natural dentition (either intact or mutilated) but for comparison of the masticatory performance of natural dentition and artificial dentures which would be generally applicable to a wide variety of foods.

In mutilated dentitions the loss in masticatory efficiency could not be compensated by a longer mastication time or an increase in the number of masticatory movements.

Psychologic disturbances during mastication in one subject decreased the masticatory performance and efficiency.

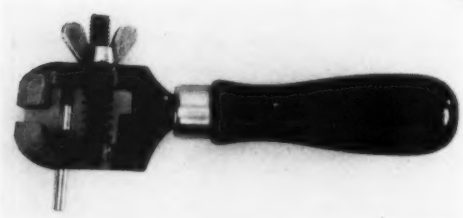
The standard deviation of the repeated tests was approximately 2 per cent, and the result with Perfectocoll as a test food agreed with the gravimetric procedure. In each instance, the particle size distribution was plotted on a logarithmic-probability graph. Differences between the individual graphs, however, cannot be explained only by the varying condition of the subjects' dentitions but must be ascribed to certain individual dissimilarities.

Afdeling Prothetische Tandheelkunde, Tandheelkundig Instituut, Rijks-Universiteit, Utrecht, The Netherlands

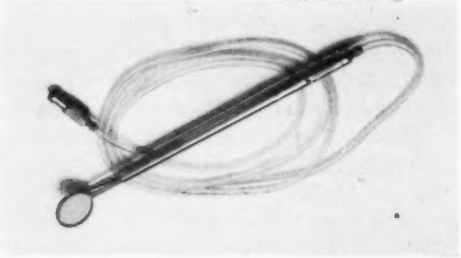
New equipment

The information reported here is obtained from manufacturers. Dental Abstracts *does not assume responsibility for the accuracy of the information. The interested reader may direct his inquiry to the manufacturer.*

A lightweight, spring-adjusted dental hand vise provides pressure of from 0 to 300 pounds. The jaws are 1¼ inches wide and have a nonslip groove. The unit is 6 inches long. It is designed for orthodontic and prosthetic work. *Panther Laboratory International, 108 East Sixteenth Street, New York 3, N.Y.*

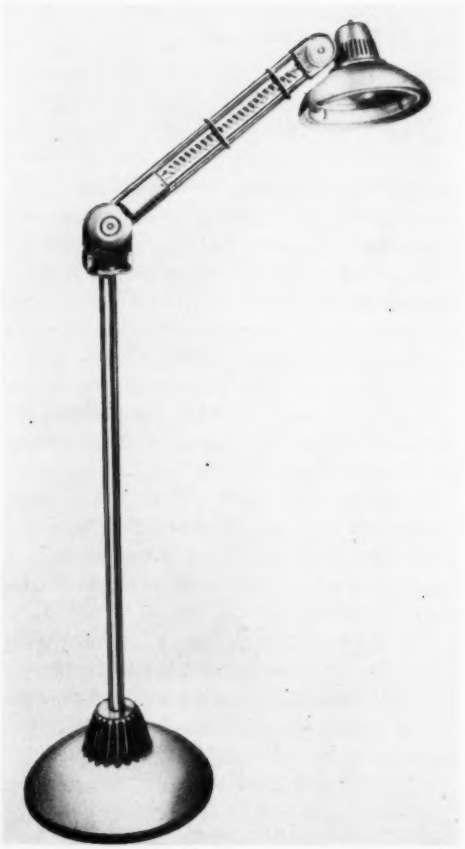


The "Clear-View" air mirror is designed so that air flows automatically over the mirror face to drive away haze, fog, water, drillings or other matter. The air blows on the mirror through an orifice in the handle. The mirror connects to any standard air syringe by means of a 54-inch plastic hose which has a check valve at one end and an adapter fitting on the other. Both mirror and handle can be disconnected quickly for sterilization. *Surgident, Ltd., 2124 South Sepulveda Boulevard, Los Angeles 25, Calif.*

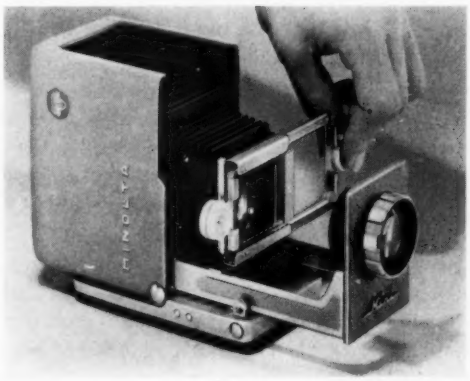


"Kromask" is designed to eliminate the problem of shade control with facings on chrome alloy work. A gold foil transfer process is used to eliminate the grey incisal discoloration of facings. The gold leaf material is mounted on a cellophane strip in a manner similar to an ordinary decal. The material is water-resistant. Each kit contains one spool of gold foil decal material, one bottle each of liquid and thinner, and brush applicator and pad. *Columbus Dental Manufacturing Co., 634 Wagner Street, Columbus, Ohio.*

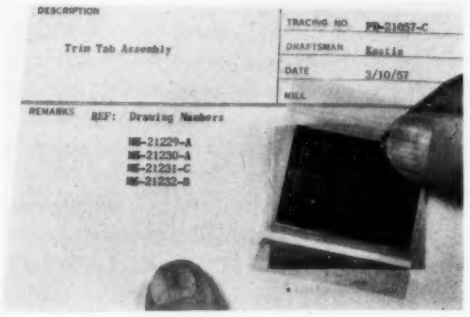
The "Trombolite" combines fluorescent and incandescent lighting on a rotating, pedestal-mounted base. The reflector contains a 60-watt incandescent bulb encircled by a 22-watt fluorescent tube. The two kinds of lighting are operated by multiple switching, and can be used separately or in combination. The light can be directed in innumerable planes by positioning the reflector, which tilts and swivels without disturbing the position of the arm. *Amplex Corp., 214 Glen Cove Road, Carle Place, Long Island, N.Y.*



The "Minolta Mini Projector" is a portable slide projector designed for the table clinician, and for dental office and home use. The projector measures 5 by 4 by 3 inches, and weighs less than 2 pounds. The short focal length lens (77 mm.) will fill a 30 by 40 inch screen from a distance of 8 feet. Four types of slide carriers are available for 33 mm. slides or horizontal film strip. An adapter allows the "Airequipt" automatic changer to be used. Slides are protected with heat-resistant filters. *D. E. Wilson and Associates, 17 West Ontario Street, Chicago 10, Ill.*



The "Snap-Jack" is a device for mounting individual microfilm images in a filing card. The device is a transparent tri-acetate holder into which the film is inserted. It accommodates an image of 16 mm., 35 mm. or 70 mm. film. A specific filmed document can be removed from a roll of film, and inserted into the Snap-Jack pocket which in turn snaps into any filing card with a precut aperture. It is designed for any situation where the document must be an integral part of a card which contains additional information. Samples are available. *Remington Rand Division of Sperry Rand Corp., 315 Fourth Avenue, New York 10, N.Y.*

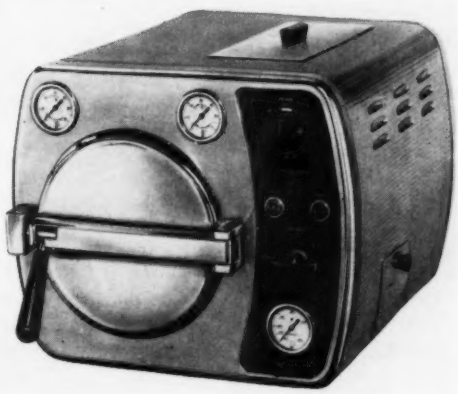


A new 20-page catalog of its "Micrometric" root canal instruments is available from the *Union Broach Co., Inc., 80-02 Fifty-first Avenue, Elmhurst, Long Island, N.Y.*

Steel plug finishing burs for friction grip handpieces are packed in assortments of six to a box. They are made in the following sizes: round no. 2 and no. 8; pear no. 4 and no. 6, and flame no. 242 and no. 245. *Premier Dental Products Co., 1001 Chestnut Street, Philadelphia 7, Pa.*

The "AMBU" portable resuscitation-suction kit consists of a hand-operated resuscitator and a foot-operated suction pump in a sturdy carrying case. The unit is compact and light. It requires no electricity or compressed air. The resuscitator consists of a breathing bag with a foam rubber lining, a nonrebreathing valve, face mask and three sizes of Berman airways. The suction pump consists of an accordion bellows activated by a stainless steel spring, a plastic trap bottle with a spare overflow valve in the stopper, and a carrying handle. *Air-Shields, Inc., Hatboro, Pa.*

A Model GN autoclave has a 7 by 14 inch chamber and is made of stainless steel. Features include a single knob control, automatic timer, a safety door that cannot be opened under pressure, a thermometer in discharge line and attractive appearance. *Pelton & Crane Co., Charlotte 3, N. C.*



Kodak periapical ultra-speed dental x-ray film no. 0 size is now available for periapical examinations of small children. The film, which offers a speed considerably faster than "Radia-Tized" film, permits shorter exposures. The high-speed emulsion is coated on both sides of a blue-tinted safety base. Film is available in packages of 50 individual packets. *Eastman Kodak Co., Rochester 4, N.Y.*

Doctoral and Masters' dissertations

In this column each month are listed recent Doctoral and Masters' dissertations of dental interest, accepted by the dental schools or graduate schools in partial fulfillment for advanced degrees. Copies of many of these theses are available from the schools through interlibrary loan.

Rat connective tissue reactions to implants of certain pulp capping and cavity lining materials. *Hala A. M. Zawawi. 1958.* M.S.D. *Indiana University.*

The marginal penetration of Ca^{45} around restorations, after 48 hours, 30 and 60 days in the oral cavities of dogs. *Saul I. Schenker. 1958.* M.S.D. *Indiana University.*

Load-deflection rates and maximum deflection of orthodontic appliances. *David T. Lawless. 1958.* M.S.D. *Indiana University.*

Histologic reaction of the interosseous suture following mechanical separation of the premaxillary bones of the albino rat. *Sanford Neuger. 1958.* M.S.D. *Indiana University.*

The organization of state dental health activities in the New England states. *Cornelius M. Bowen. 1958.* M.P.A. *New York University.*

The effect of Nisentil on the induction dosage of intravenous barbiturates. *Richard James DeLapa. 1958.* M.SC. *Ohio State University.*

A clinical investigation of three synthetic narcotic drugs. *Don Keith Robinson. 1958.* M.SC. *Ohio State University.*

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